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The BULLETIN

American Society of Hospital Pharmacists

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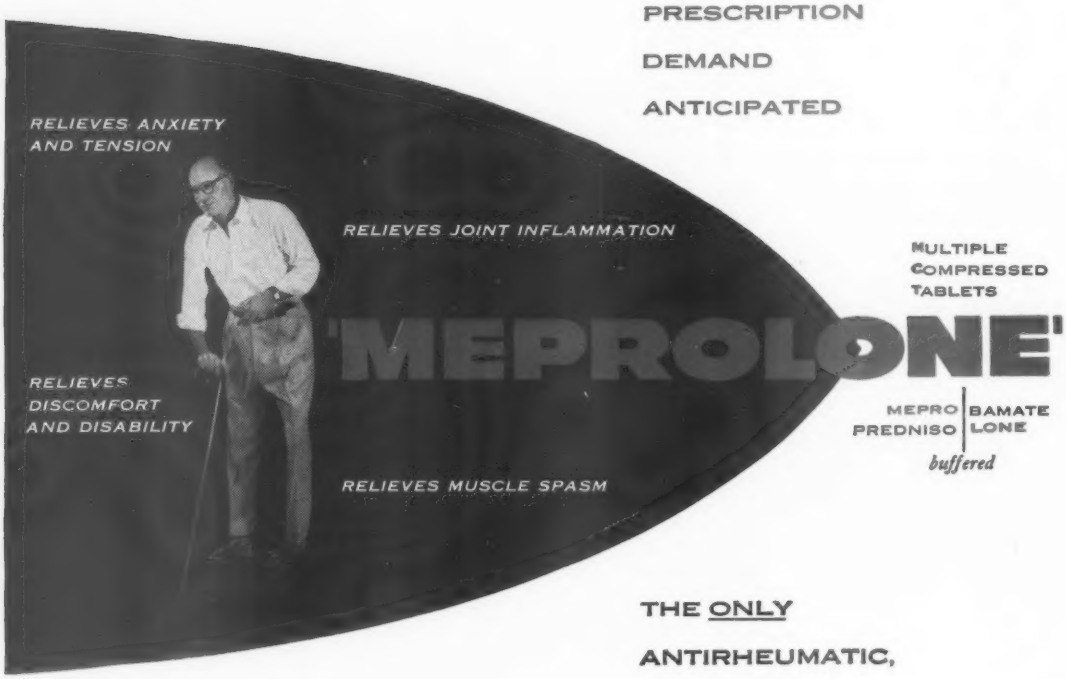

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DRUG EVALUATIONS

by the Council on Drugs of the American Medical Association

The following monographs and supplemental statements on drugs have been authorized by the Council on Drugs of the American Medical Association for publication and inclusion in *New and Nonofficial Drugs*. They are based upon the evaluation of available scientific data and reports of investigations. In order to make the material even more valuable, dosage forms and preparations of individual drugs have been added to the monographs. These dosage forms and preparations were not taken from material published in the *Journal of the American Medical Association* by the Council on Drugs; rather, they were obtained from such manufacturers' brochures, news releases, etc., which were available to us at the time of publication. An attempt has been made to make the list of dosage forms as complete as possible. However, no guarantee can be made that the list of preparations is complete and it is suggested that hospital pharmacists consult manufacturers' releases for additional dosage forms and preparations.

The issues of the *Journal of the American Medical Association* from which each monograph has been taken is noted under each monograph. Monographs in this issue of THE BULLETIN include those published in the *Journal* to February 1, 1957.

NOTICE

New and Nonofficial Remedies 1957 is now available from your local bookstore and from the publishers, J. B. Lippincott Company, Philadelphia, Pa. This 1957 edition contains monographs of drugs evaluated by the Council on Drugs of the American Medical Association and published in the Journal of the A.M.A. to October 1956. The index listed below contains those drugs evaluated and published between October 1, 1956 and February 1, 1957.

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Name of Council Changed
and Title Of Its Publication

By authorization of the Board of Trustees of the American Medical Association, the Council has changed its name from the Council on Pharmacy and Chemistry to the Council on Drugs, in order that its proper sphere of interest and activity may be more accurately identified. The new name will serve to emphasize the basic function of the Council: to evaluate available evidence for the clinical application of all new drugs as redefined under its new program of operation instituted in 1955.

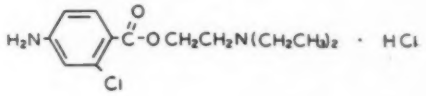
The Council also has adopted the revised title New and Nonofficial Drugs to supersede the title New and Nonofficial Remedies for its well-known publication describing currently evaluated drugs. The revised title for the publication was selected to reflect more clearly the inclusion of monograph descriptions for evaluated prophylactic and diagnostic agents, as well as for therapeutic agents, including descriptions for drugs of questionable or unestablished clinical usefulness.

The change in name of the Council and in the title of its publication is instituted in the Council's Column with this issue of THE JOURNAL to anticipate its implementation in the 1958 edition of the book. Because of previously scheduled early release, the currently revised 1957 edition bears the original publication title and name of the Council, but it maintains the expanded scope of the book initially implemented in the 1956 edition.

J. Am. Med Assoc. *163*:645 (Feb. 23) 1957.

Chloroprocaine Hydrochloride
Nesacaine® Hydrochloride

CHLOROPROCAINE HYDROCHLORIDE is β-diethylaminoethyl 2-chloro-4-aminobenzoate hydrochloride. — The structural formula of chloroprocaine hydrochloride may be represented as follows:



Actions and Uses

Chloroprocaine hydrochloride, a local anesthetic agent, is similar in chemical structure and pharmacological action to the parent compound, procaine hydrochloride. The halogenated derivative produces a more rapid onset of action, with an anesthetic potency at least twice as great as that of a similar

amount of procaine. Its toxicity is low and of the same order of magnitude as that of procaine; the toxic effects are qualitatively similar. The drug produces little vasoconstriction; therefore, its toxicity may be appreciably decreased if absorption is slowed by administration in admixture with pressor agents, such as epinephrine. Chloroprocaine, like procaine, is hydrolyzed by plasma cholinesterase. The hydrolysis of the chlorinated derivative proceeds more rapidly than that of the parent compound, and the concentration of cleavage products liberated from therapeutic doses is innocuous. The drug is not an efficient local anesthetic for topical application to the skin or mucous membranes.

Chloroprocaine hydrochloride, either with or without the addition of epinephrine in suitable dilution, is useful as a local anesthetic in minor as well as in general surgical procedures. The drug has been successfully employed to produce analgesia or surgical anesthesia by the techniques of infiltration, field block, and regional nerve block, including caudal and epidural block. Although its usefulness for these procedures has been sufficiently well demonstrated to warrant its trial, only subsequent clinical experience will determine its ultimate toxic potentialities as compared to those of longer established agents, such as procaine and tetracaine hydrochloride. The use of chloroprocaine hydrochloride for continuous peridural and spinal (subarachnoid) anesthesia has not been evaluated.

Dosage

Chloroprocaine hydrochloride is injected at various sites according to the type of local anesthesia to be produced. Because of rapid absorption and danger of untoward reactions, the dosage must be reduced when the drug is used without epinephrine. As with other local anesthetic agents, the dosage of chloroprocaine hydrochloride must be adjusted according to the need of the patient and the purpose for which anesthesia is required.

For infiltration anesthesia, a 1% solution in admixture with a 1:200,000 dilution of epinephrine hydrochloride is ordinarily used, the volume injected depending on the anatomic site and the extent of area to be anesthetized. For most procedures, volumes ranging from 2 cc. to a maximum of 75 cc. will usually suffice. Should larger volumes be necessary, as in thoracoplasty, the concentration of the chloroprocaine solution per unit volume should be correspondingly reduced. For regional nerve blocks, the volume and concentration of the agent vary according to the site and structure concerned, for example, 25 cc. of a 2% concentration for brachial plexus block and 3 cc. for cervical block. Except for anesthesia of the nose, ears, fingers, toes, and scrotal areas, the agent should be injected with a 1:200,00 dilution of epinephrine hydrochloride. Epinephrine should be withheld if cyclopropane, trichloroethylene, ethyl chloride, or other anesthetics containing halogen are to be employed.

For single-injection caudal (extradural sacral) block, the dose of chloroprocaine hydrochloride usually employed is 20 cc. of a 2% solution containing epinephrine 1:200,000. For caudal-transsacral block, 5 cc. of a 2% solution with epinephrine 1:200,000 is injected into each sacral foramen, and 20 cc. of the same solution is introduced into the caudal canal. For epidural anesthesia by the single dose technique, both a 2% and 3% solution have been used, with and without added vasoconstrictors. The volume injected varies with the concentration of the solution employed and the operative procedure or areas to be anesthetized. In general, the volume should not exced 25 to 35 cc. especially when the 3% solution is used. Further study is necessary to determine the precise dosage for continuous epidural anesthesia.

Applicable commercial name: Nesacaine Hydrochloride.

Maltbie Laboratories Division, Wallace & Tiernan Inc., cooperated by furnishing scientific data to aid in the evaluation of chloroprocaine hydrochloride.

—*J. Am. Med. Assoc.* 163:38 (Jan. 5) 1957.

Preparations

Injection Chloroprocaine (Nesacaine) Hydrochloride 1 percent and 2 percent, 30 ml. multiple dose vials; 3 percent, 30 ml. single dose vials.

Erythromycin

Intramuscular Use

The Council has evaluated the usefulness and safety of intramuscularly administered erythromycin (Ilotycin). On the basis of currently available evidence, the Council concluded that this use is justified in certain situations. Thus, the antibiotic may be used for the treatment of severe infections caused by beta-hemolytic streptococci, pneumococci, and micrococci and in patients who are allergic to penicillin or whose organisms, notably micrococci, are resistant to penicillin but sensitive to erythromycin. For therapy of the susceptible infections, intramuscular administration should be reserved for patients in whom oral medication is not feasible or intravenous administration of soluble salts of the drug is difficult or impractical. These limitations are necessitated by the pain that the drug may produce at the site of injection. Although sterile abscess formation and other signs of local tissue irritation ordinarily are not observed after the usual doses, pain and induration may follow intramuscular administration of larger doses.

When indicated, erythromycin is administered by deep intramuscular injection, preferably in the gluteal muscles or the outer aspect of the thigh, in average doses of 100 mg. (2 cc. of a solution containing 50 mg. per cubic centimeter). This may be repeated at 4 to 6 hour intervals as needed and as tolerated by the patient. No more than 4 cc. of the solution should be injected at one time, and the site of administration should be changed for each subsequent injection. Administration in the arm muscles should be avoided because of associated pain. In general, the use of erythromycin given intramuscularly in infants should be avoided because of the relatively small muscle mass. In those instances in which the intramuscular administration of erythromycin is necessary in infants, proportionately smaller doses should be used.

The Council voted to amend New and Nonofficial Remedies accordingly to describe the intramuscular use of erythromycin.

Eli Lilly & Company cooperated by furnishing scientific data to aid in the evaluation of the intramuscular use of erythromycin.

—*J. Am. Med. Assoc.* 163:39 (Jan. 5) 1957.

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BIBLIOGRAPHY

(1) Boone, J.D.; Munoz, R., and Dillon, J.B.: Anesthesiology *17*:284, 1956. (2) Zima, O.; von Werder, F., and Hotovy, R.: Anaesthesist *3*:244, 1954. (3) Fitzpatrick, L.J.; Clarie, D'A., and Mersch, M.A.: To be published. (4) Blake, M.W., and Perlman, P.L.: J. Pharmacol. & Exper. Therap. *117*:287, 1956. (5) Ayd, F.J., Jr.: Neraval: A new anesthetic for electroconvulsive therapy, Paper presented at annual meeting, Electroshock Research Association, Chicago, Illinois, April 29th, 1956. (6) Irwin, S.; Stagg, R.D.; Dunbar, E., and Govier, W.M.: J. Pharmacol. & Exper. Therap. *116*:317, 1956. (7) Reifferscheid, M., and Dietmann, K.: Deutsche med. Wchnschr. *79*:638, 1954. (8) Dietmann, K.: Deutsche med. Wchnschr. *79*:1748, 1954.

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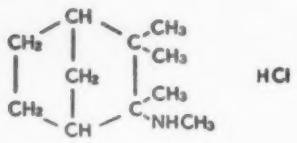
Mecamylamine Hydrochloride

Inversine® Hydrochloride

MECAMYLAMINE HYDROCHLORIDE is 3-methylaminoisocamphane hydrochloride.—The structural formula of mecamylamine hydrochloride may be represented as follows:



Actions and Uses

Mecamylamine hydrochloride, a secondary amine, exerts a powerful inhibitory effect on the transmission of impulses at autonomic ganglions. Although it is not a quarternary ammonium compound, its ganglionic blocking action is almost identical to that of hexamethonium; therefore, the drug effects a decrease in blood pressure in both normotensive and hypertensive subjects. Unlike hexamethonium, mecamylamine hydrochloride is almost completely absorbed from the gastrointestinal tract and is effective by the oral route. Because it is more uniformly absorbed than hexamethonium, fluctuations in gastrointestinal activity, such as diarrhea and constipation, do not produce so great a variation in hypertensive effectiveness with oral dosage. The drug exerts a longer duration of action than does hexamethonium, and equivalent reduction in blood pressure may be achieved with a lower dose. Since the onset of action is more gradual than that with hexamethonium, the incidence of sudden drops in blood pressue is appreciably reduced. As with all ganglionic blocking agents, prolonged administration leads to decreased effectiveness. This tolerance is not as pronounced with mecamylamine as with hexamethonium and is somewhat less than that observed after therapy with pentolinium tartrate. Cross tolerance between mecamylamine and the other ganglionic blocking agents has not been observed.

In general, the indications for therapy with mecamylamine hydrochloride are the same as those for other ganglionic blocking agents. Thus, the drug may be employed for the treatment of moderate to severe hypertension; it is sometimes successful in arresting the malignant phase of hypertension. Because of the unpleasant nature of side-effects that frequently accompany therapy with ganglionic blocking agents, the use of mecamylamine should generally be reserved for those patients with the more severe forms of hypertension who have not responded adequately to milder drugs such as the Rauwolfia alkaloids. It should never be used in patients with mild or labile hypertension. When employed under carefully controlled conditions with adequate attention to proper regulation of dosage, mecamylamine may be expected to reduce blood pressure effectively and to ameliorate various manifestations of hypertensive-cardiovascular disease. These include such symptoms as headache, dizziness and vertigo, hypertensive encephalopathy and cerebral or subarachnoid hemorrhage, retinopathy, cardiac hypertrophy, and, in some cases, cardiac decompensation. Although the drug may be of benefit in some hypertensive patients with angina pectoris, care should be exercised in its administration, since in other patients it may exacerbate anginal attacks or precipitate myocardial infarction in the presence of coronary insufficiency.

For the treatment of the more severe types of hypertension, mecamylamine can be employed in conjunction with reserpine. Such combination therapy may sometimes produce a more intense antihypertensive effect than can be obtained with mecamylamine alone. In addition, this regimen allows for a lower total dosage of mecamylamine, with a consequent lessening in the side-effects attributable to ganglionic blockade.

Like all agents of this class, mecamylamine hydrochloride is capable of producing a variety of unpleasant side-effects referable to inhibition of both sympathetic and parasympathetic nervous systems. Dryness of the mouth, visual disturbances, constipation preceded by diarrhea, urinary retention, anorexia, nausea and vomiting, weakness and fatigue, sedation, interference with sex functions, dizziness, syncope, and paresthesias have been observed in patients undergoing therapy with this drug. Patients should likewise be warned about the occurrence of orthostatic (postural) hypotension. Extreme care must be exercised with regard to bowel function, since the constipation that frequently accompanies therapy with mecamylamine can proceed into paralytic ileus. To avoid this serious complication, some physicians advise routine concomitant administration of laxatives; however, all patients should be advised to discontinue hypotensive therapy immediately if abdominal distention, decreased borborygmi, or other signs of bowel stasis become evident. In such cases, intensive cathartic therapy is indicated; cholinergic agents, such as neostigmine methylsulfate or bethanechol chloride, may be used to treat impending or frank ileus and urinary retention. In poor-risk patients with malignant hypertension and azotemia or other signs of renal insufficiency, often in association with cerebral atherosclerosis, the administration of large doses may rarely produce tremor or mental aberrations, such as delusions or hallucinations.

Mecamylamine hydrochloride has not been studied for sufficiently long periods to determine with certainty the frequency and severity of all side-effects as compared with those of other ganglionic blocking agents. On the basis of current evidence, it would appear that these are no more troublesome than those with other agents of this class and that some reactions, notably impairment of vision, are less in number and severity than those caused by hexamethonium.

Contraindications to the use of mecamylamine hydrochloride are the same as those for other ganglionic blocking agents. These include such conditions as severe coronary insufficiency, recent myocardial infarction, retinal and cerebral thrombosis, and any other disorder characterized by severe reduction of blood flow to a vital organ. The drug should be administered with caution to patients with renal insufficiency. Rapid, excessive reduction in blood pressure is also dangerous in patients with severe and generalized atherosclerosis. If necessary, pressor amines may be administered to combat excessive hypotensive effects; however, since many patients under therapy with ganglionic blocking agents are more reactive than normal to pressor amines, dosage must be reduced accordingly. Since the drug blocks the normal vasoconstrictor hemostatic mechanisms, its use is contraindicated in any situation in which there is a large reduction in

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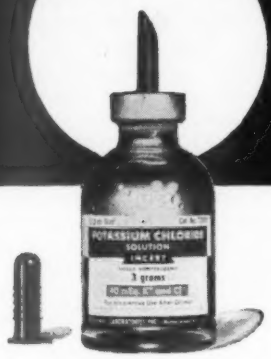

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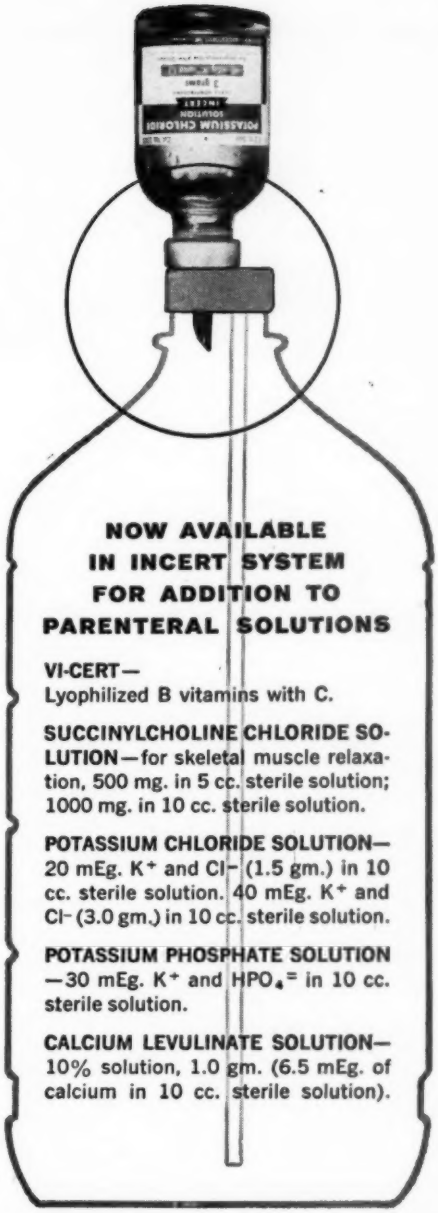

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POTASSIUM PHOSPHATE SOLUTION—30 mEg. K^+ and $HPO_4^=$ in 10 cc. sterile solution.

CALCIUM LEVULINATE SOLUTION—10% solution, 1.0 gm. (6.5 mEg. of calcium in 10 cc. sterile solution).

TRAVENOL LABORATORIES, INC. MORTON GROVE, ILLINOIS

Pharmaceuticals Products Division of **BAXTER LABORATORIES, INC.**

blood volume. Mecamylamine hydrochloride is contraindicated also in the presence of glaucoma, organic pyloric stenosis, and uremia.

Dosage

Mecamylamine hydrochloride is administered orally. Dosage is highly individualized according to the severity of the hypertension and the response of the patient. The latter varies greatly. Ideally, dosage should be adjusted to the point where desired blood pressure can be maintained without the appearance of severe side-effects. This situation is not always easily attainable. In addition to great variations in individual susceptibility, other factors, such as excessive heat, fever, infection, hemorrhage, pregnancy, antihypertensive or other drugs, alcohol, vigorous exercise, surgery, and anesthesia, alter the hypotensive response. Excessive salt loss, such as that occurring after diarrhea, vomiting, and mercurial diuresis, increases the hypotensive effect of the drug and necessitates reduction in dosage. Diurnal variations in blood pressure require administration of lower doses in the morning than those given in the afternoon and evening. Seasonal variations also alter the hypotensive effect of mecamylamine, larger doses being required in the winter months than in the summer. It should also be remembered that ordinarily a smaller reduction in blood pressure is produced by the drug when the patient is in a supine or sitting position; therefore, dosage should be determined on the basis of blood pressure reading made with the patient in the standing position. Since frequent standing blood pressure recordings under basal conditions afford the best method for accurate dosage adjustment, these are best carried out in the home by the patient or a member of the family.

Therapy is initiated by the administration of 2.5 mg. twice daily. This dosage is then increased by increments of 2.5 mg. at intervals of not less than two days until the desired blood pressure response has been obtained. The average daily dose required for maintenance is about 25 mg. in three divided doses. Individual susceptibility to the drug is so great that as little as 1 mg. may mean the difference between tolerable and intolerable side-effects.

Applicable commercial name: Inversine Hydrochloride.

Merck Sharp & Dohme Research Laboratories, Division of Merck & Co., Inc., cooperated by furnishing scientific data to aid in the evaluation of mecamylamine hydrochloride.

—J. Am. Med. Assoc. 162:1469 (Dec. 15) 1956.

Preparations

Tablets Mecamylamine (Inversine) Hydrochloride 2.5 mg. bisected, and 10 mg. quarter-sected.

Phytonadione

Oral Use

The Council has evaluated the oral use of phytonadione (Mephyton) for the treatment of hypoprothrombinemia induced by anticoagulant therapy and other conditions characterized by over-prolonged prothrombin times. On the basis of currently available evidence, the Council concluded that phytonadione is effective by the oral route and that this route is preferable to intravenous administration, except in emergency situations in which bleeding is imminent or has actually occurred or in patients in whom oral therapy is impractical or contraindicated. Thus, the drug may be used to combat hypoprothrombinemia, whether caused by anticoagulant therapy, inadequate absorption or endogenous production of vitamin K, neonatal deficiency of prothrombin, or the toxic action of agents such as salicylates and phenylbutazone.

For the nonemergency treatment of hypoprothrombinemia induced by anticoagulant therapy, initial doses of 5 to 10 mg. should be administered orally. If a subsequent determination of prothrombin time indicates the need for more vigorous therapy but does not indicate the necessity for intravenous medication, additional doses of 15 to 25 mg. or more may be administered orally. Immediate intravenous infusion of 10 to 50 mg. of phytonadione in an emulsion is indicated for the emergency treatment of undue hypoprothrombinemia induced by anticoagulant therapy. For the treatment of hypoprothrombinemic conditions of other etiology, the drug is administered either intravenously or orally, depending on the severity of the situation. Dosage by either route is the same and usually ranges from 2 to 20 mg.; on occasion, as much as 25 to 50 mg. may be necessary. If prothrombin deficiency is caused by obstruction of bile or loss of it through biliary fistula, bile salts should be given with orally administered phytonadione.

The Council voted to amend New and Nonofficial Remedies accordingly to describe the oral use of phytonadione.

Merck Sharp & Dohme Research Laboratories, Division of Merck & Co., Inc., cooperated by furnishing scientific data to aid in the evaluation of the oral use of phytonadione.

—J. Am. Med. Assoc. 163:39 (Jan. 5) 1957.

Prednisolone

Topical Use

The Council has evaluated the topical use of prednisolone (Meti-Derm) for the local management of dermatoses susceptible to gluco-steroid therapy. On the basis of currently available evidence, the Council concluded that the drug, incorporated in a suitable dematological vehicle, is effective in ameliorating cutaneous manifestations of acute and chronic dematoses that have an allergic or inflammatory basis and are associated with pruritus. These include such conditions as contact dermatitis, various forms of atopic dermatitis, seborrheic dermatitis, nonspecific anogenital pruritus, and lichenified pruritus. No systemic side-effects have been observed after absorption of the drug. In some cases, sensitization or irritation may follow its topical application, particularly to an eroded skin; however, this is more likely to be caused by the base in which it is incorporated than by prednisolone itself. The drug should not be applied to infected areas of the skin.

For topical administration, a cream containing 5 mg. of prednisolone per gram is applied to the affected areas of the skin three or four times daily.

The Council voted to amend New and Nonofficial Remedies accordingly to describe the use of prednisolone by the topical route.

Schering Corporation cooperated by furnishing scientific data to aid in the evaluation of the topical use of prednisolone.

—J. Am. Med. Assoc. 162:1315 (Dec. 1) 1956.

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Crystalline Trypsin

Intramuscular Use

The Council has evaluated the intramuscular use of an oil suspension of crystalline trypsin (Parenzyme) for the treatment of thrombophlebitis, phlebothrombosis, ocular inflammations, traumatic wounds, and varicose and diabetic leg ulcers. Currently available evidence suggests that many patients respond favorably to the drug. While few controlled clinical studies have been published to date, other reports indicate that a majority of patients refractory to standard modalities obtain beneficial results from trypsin administered intramuscularly. It should not be given in lieu of anticoagulants but as adjunctive therapy for reduction of inflammation and edema at the site of phlebitic processes.

Crystalline trypsin in oil produces pain and induration at the site of intramuscular injection in a sizable proportion of patients; however, the incidence of these side-effects may be appreciably reduced if a thoroughly dry and sharp needle is employed. Febrile reactions and leukocytoses, resembling those produced by parenteral administration of foreign protein, are rare. Occasionally, angioneurotic edema, hives, and urticaria occur. The drug is contraindicated or should be used with extreme caution in patients with renal or hepatic damage, blood clotting abnormalities, or hemorrhagic states. Its ultimate safety after long-term intramuscular therapy is not as yet completely determined.

Crystalline trypsin in oil is administered by deep intragluteal injection, alternating sites and buttocks. Prior to administration, sensitization tests should be performed on patients with a history of hypersensitivity. Doses of 2.5 to 5 mg., one to four times daily for three to eight days, have been administered and should be considered tentative. Dosage must be individualized and depends on the severity of symptoms and the degree of response. Adequate precautions against accidental intravenous injections should be exercised.

The Council voted to amend New and Nonofficial Remedies accordingly to describe the intramuscular use of a suspension of crystalline trypsin in oil.

The National Drug Company cooperated by furnishing scientific data to aid in the evaluation of the intramuscular use of crystalline trypsin.

—*J. Am. Med. Assoc.* **162**:1315 (Dec. 1) 1956.

Report to the Council

The Council has authorized publication of the following report. Nonproprietary terminology is used for drugs that are mentioned; when such terminology is not considered to be generally well known, its initial appearance is supplemented by parenthetic insertion of names known to be applied to commercial preparations.

H. D. KAUTZ, M.D., *Secretary*

Hypertension

Current Status of Therapy

HENRY A. SCHROEDER, M.D. AND H. MITCHELL PERRY, JR., M.D., ST. LOUIS

Means for controlling the excessive generalized vasospasm found in patients with chronic arterial hypertension have greatly improved during the past 5 years. The development of new drugs with specific actions has pointed up the several mechanisms that act together to cause vasospasm; it has resulted in alterations toward or to normal of a disturbed physiological and biochemical state and has effected considerable reduction in morbidity and mortality and sometimes remarkable clinical improvement in patients suffering from fatal forms of the disease. Furthermore, the question of what is cause and what is effect has been clarified. The results in well-treated patients, formerly suffering from hypertension of severe degrees and often with serious secondary conditions, may be summarized as follows: a virtual disappearance of congestive heart failure, formerly the major cause of death; considerable reduction in incidence of cerebral vascular accidents, especially hemorrhage; slowing, halting, or even regression of progressive renal functional damage; and halving of the 100% mortality (for at least three years) in cases of malignant hypertension that have advanced to azotemia. In a sizable proportion of cases, the underlying process has apparently reversed itself enough to allow drastic reduction of doses or even discontinuation of therapy. Thus neurosurgery has become unnecessary except in selected cases, and other less specific forms of therapy have been made obsolete.

In order to understand the rationale for the use of the several drugs and methods, a brief résumé of present concepts of basic pathogenesis is in order. Intermittent, rapidly fluctuating generalized vasospasm is considered to be neurogenic, medicated through the sympathetic portion of the autonomic nervous system or, in the unusual case of a pheochromocytoma, by the sympathetic effector substances, levarterenol (norepinephrine) and epinephrine. Drugs are available that act upon sympathetic areas in the brain, upon autonomic ganglia, and, for diagnostic purposes, upon the sympathetic effector substances at the junction of nerve and vascular smooth muscle. Surgical sympathectomy accomplishes the same result to some degree.

Certain known and some unknown factors in time convert intermittent neurogenic vasospasm into chronic sustained vasospasm. This form is mediated by humoral, probably nephrogenic, vasoconstrictor substances. A different type of drug, acting directly upon vascular smooth muscle, is available to counteract this influence. The drug also has the capacity to destroy the activities of most known and suspected humoral pressor substances implicated in hypertension. When hypertension becomes chronic, therefore, both humoral (nephrogenic) and neurogenic influences operate together, the former engrafted upon the latter. Renal ischemia is the invariable accompaniment.

In certain cases of overt localized disease of the adrenal cortex (adenoma), and perhaps to a slight degree in many other cases of hypertension, vascular smooth muscle becomes sensitized both to normal and to abnormal vasoconstrictor influences, neurogenic and humoral. Sensitization is mediated through the sodium ion plus sodium-retaining steroid hormones. Overproduction of adrenal cortical salt-retaining hormones can probably affect intracellular constituents of electrolytes. In the ratio $Na^+ + K^+ + OH^- / Mg^{++} + Ca^{++} + H^+$ muscular irritability is increased by an increase in the numerator and decreased by an increase in the denominator. Because renal ischemia even of a slight

From the Hypertension Division, Department of Internal Medicine, Washington University School of Medicine, and Barnes Hospital.

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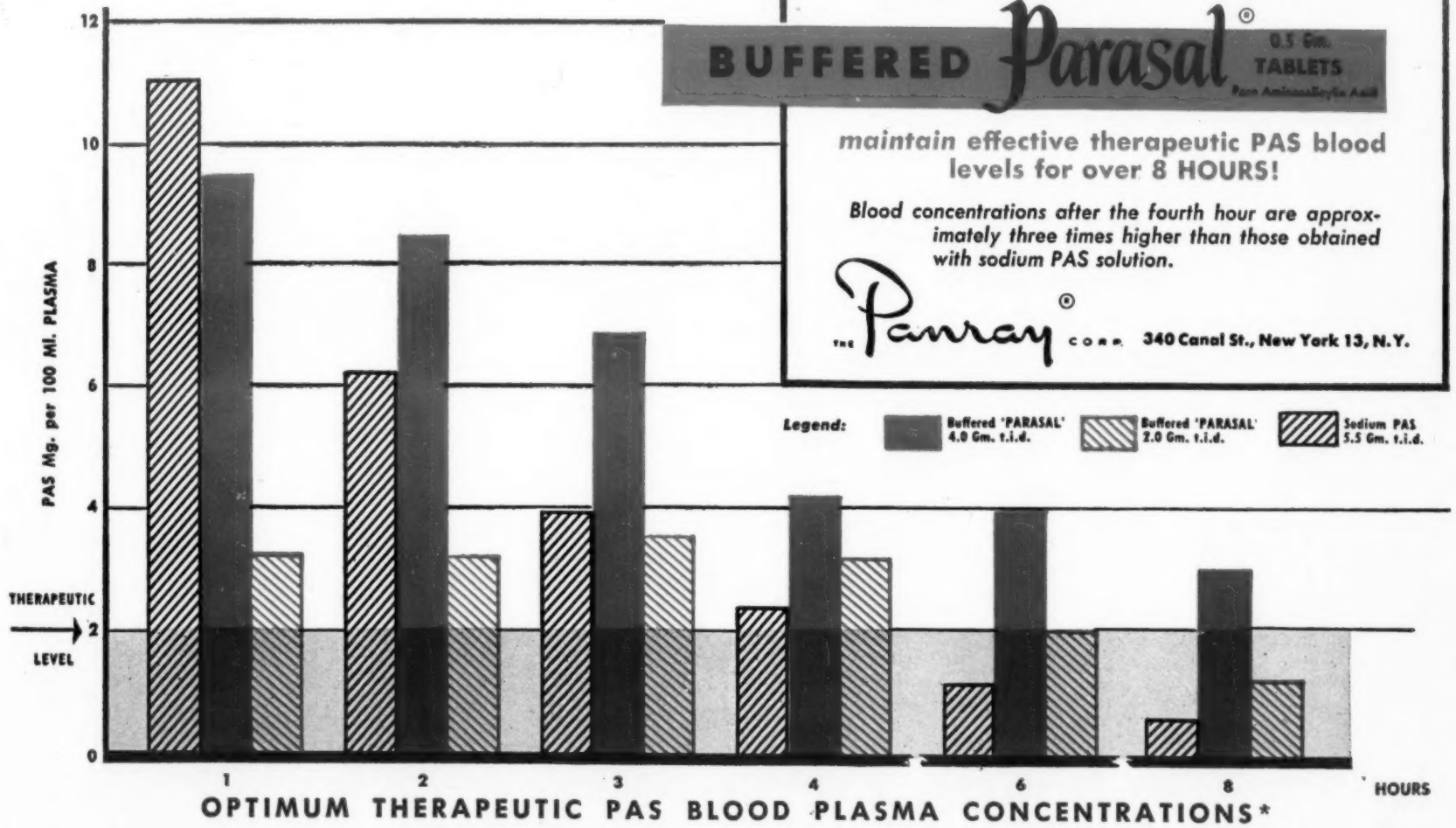

OPTIMUM THERAPEUTIC PAS BLOOD PLASMA CONCENTRATIONS*

Ref.: Deeb, E. N. & Vitagliano, G.R.: A. Rev. Tuber. & Pul. Dis.: 72,543-7 (Oct. '55)

*based on multiple dosages, levels determined after 2nd dose of day.

degree is associated with urinary loss of sodium chloride, presumably the adrenal cortex is stimulated to produce more salt-retaining steroids than usual. Methods for counteracting this influence include adrenalectomy, metabolic antagonists to specific steroid hormones, and depletion of sodium from the body. This influence is usually of secondary pathogenetic importance except when functioning adenomas are present, when it can be primary. Thus it is obvious that when two vasospastic influences act together to cause hypertension, two counteracting drugs or methods must be used to achieve reversal of vasospasm.

Drugs and Procedures Available

Drugs Acting Directly or Indirectly on Central Sympathetic Areas.—Alkaloids from species of Rauwolfia, of which reserpine is one, act on cerebral centers. Reserpine, a very mild antihypertensive agent, acts by displacing serotonin from receptors in corticohypothalamic tracts, especially those to the posterior (sympathetic) portion of the hypothalamus. Although the drug is rapidly excreted, these receptors are blocked for several days. The result is a reduction of the sympathetic outflow and relative parasympathetic overactivity; therefore, nervous reactions to stress by vasospasm are partly inhibited. This drug also releases serotonin from platelets and the intestines. Its usual side-effects are many and frequent. Those resulting from parasympathetic overactivity are bradycardia, gastric hyperacidity, and gastrointestinal hypermotility (peptic ulcer has apparently been activated and ulcerative colitis initiated by reserpine). Those probably resulting from serotonin depletion are loss of affect, drive, ambition, and the ability to form new concepts and meet new situations (effects similar to those of a medical prefrontal lobotomy). Increased appetite and decreased nervous energy may lead to obesity, and nasal stuffiness has occasionally caused epistaxis in older individuals with atherosclerotic arteries. More serious late side-effects, possibly caused by excessive depletion of serotonin, are anxiety, nervousness, insomnia, and wild dreams and nightmares; eventually, agitated depressive psychosis with suicidal tendencies may occur, which places it among the drugs with occasional fatal reactions. Return of function after a psychosis has developed may be delayed for several weeks or months.

The dosage-response curve to reserpine is extremely flat; therefore, large initial doses (1 to 4 mg.) can be given safely. The mild hypotensive effect precludes any exact statement as to optimal dosage, although frequently a dose of 0.1 to 0.25 mg. is satisfactory for maintenance. Since some effect usually persists for weeks, a single daily oral dose is adequate. Normotension is usually achieved by this agent only in the mildest cases with considerable emotional overlay.

Chlorpromazine (Thorazine) is also a serotonin antagonist, although its primary action is not to paralyze cerebral serotonin receptors but rather to affect the vasomotor center in some manner. Large doses produce not only bradycardia and a slight to moderate fall of blood pressure but also many side-effects. Thus it is of little value as an antihypertensive agent other than indirectly through its sedative action.

Protoveratrines A and B (Veralba), two alkaloids extracted from species of Veratrum, act at a similar or lower level by stimulating the carotid sinus and aortic depressor nerves (the baroreceptors), thus causing an increase in their depressor activity. The pathway is through the glossopharyngeal nerve to the vasomotor center. Side-effects caused by vagal stimulation include bradycardia, increased gastrointestinal motility, gastic hyperacidity, nausea, and vomiting. Intermittent hypotension or normotension can be achieved only by careful regulation of dose, which varies from one individual to another.

The initial dose of protoveratrines A and B, most satisfactory when given orally, is 0.5 mg. three times a day. This dose is increased by increments until the desired effect is produced or nausea supervenes. Ordinarily the margin of safety between therapeutic and toxic doses is low, making dosage critical. The very rapid appearance of tolerance precludes the maintenance of normotension with this agent alone.

Drugs Acting to Interrupt Somatic Autonomic Nerves.—Of the four drugs most commonly used clinically to interrupt somatic autonomic nerves, one is a secondary amine and three contain tetracovalent nitrogen (quaternary ammonium) as does acetylcholine. Special configurations in the molecules apparently cause predilections for autonomic ganglia, just as other configurations of tetracovalent nitrogen promote acetylcholine inhibition at myelinated nerve endings on striated muscle (curare, succinylcholine, decamethonium, and other curariform drugs).

The four orally effective blocking agents are hexamethonium, pentolinium (Ansolysen), chlorisondamine (Ecolid), and mecamylamine (Inversine). The amine, mecamylamine, is entirely absorbed from the gastrointestinal tract, while the three quaternary ammonium drugs are absorbed to varying and unpredictable extents. All have similar clinical effects and durations of action. No evident metabolism has been shown for any of them, and all are excreted by the kidney. Potentiation of autonomic blockade results from gastrointestinal hypomotility, which allows increased absorption; renal failure, which delays excretion; and diminished intake of sodium. Tolerance is characteristic of blocking agents when they are used alone. Moreover, the danger of postural hypotension ordinarily precludes lowering the blood pressure to normal in any but the erect position, with the result that some authorities insist on the patient sleeping on an incline with the head up. Both tolerance and postural hypotension usually may be prevented by simultaneously administered hydralazine (Apresoline).

The pharmacological effect of autonomic blocking agents is that of both sympatholysis and parasympatholysis. The desired antihypertensive effect results from sympatholysis. Excessive hypotension may rarely lead to renal failure requiring levarterenol (Levophed) for its control. Undesired side-effects result from parasympatholysis; the major ones are retention of urine and intestinal paralysis. The minor ones include loss of visual accommodation, dryness of mucous membranes, and diminution of normal sweating.

The required dose of autonomic blocking agents is unpredictable and must be determined separately for each patient. The effect can often be enhanced and rendered more reproducible if these drugs are taken on an empty stomach. Orally mecamylamine is about 50 times as effective as hexamethonium, 10 times as effective as pentolinium, and 5 times as effective as chlorisondamine. For each the duration of action of a single dose varies between 3 and 6 hours, hexamethonium being the shortest acting and chlorisondamine

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and mecamylamine having the longest effect. The wide variety of advocated regimens reflects the differing goals of therapy as well as the variability of individual patients.

The automonic blocking agents can be used parenterally in hypertensive emergencies such as encephalopathy and cardiac failure. Even when injected, the required dose is unpredictable. In general, the more acutely a patient requires therapy, the less drug he needs. The maximum safe initial dose of hexamethonium chloride, given subcutaneously or intramuscularly, may be as little as 0.25 mg. Larger doses can be given into an extremity when a tourniquet can be placed above the site of injection, or by slow intravenous drip, the blood pressure being "titrated" to the desired level. If circulation is adequate, doses given subcutaneously can safely be successively doubled at 10-minute intervals until sufficient lowering of the blood pressure is obtained. To maintain normotension, as much as 25 or 50 mg. of hexamethonium given subcutaneously may be needed every 4 hours. When necessary the systolic pressure can often be maintained within a range of 20 mm. Hg by parenterally given autonomic blocking agents. In our experience, this can best be done by giving a full dose every 1, 2, or 4 hours if the systolic pressure is above the desired range, half the dose if it is within the range, and none if it is below the range. The mean pressure can then be lowered on successive days depending on the patient's condition. In those rare cases in which gastrointestinal symptoms require substitution of long-continued parenteral therapy, the average maintenance dose of intramuscular hexamethonium approximates one-twentieth of that required by mouth. For pentolinium the parenteral dose approximates one-fifth of the oral dose; for chlorisondamine, two-fifths; and for mecamylamine, the two are equal.

When localized atherosclerosis is present, the violent fluctuations of blood pressure sometimes induced by drugs can be hazardous. Ischemia may result either from a lowered blood pressure in vessels that cannot dilate as widely as the remainder of the vascular system or from thrombosis beginning on an atherosclerotic plaque when blood flow is impaired. Thus, cerebral thrombosis, mesenteric thrombosis, and coronary thrombosis have occurred rarely and must be kept in mind when atherosclerotic patients are treated. Ischemia has also caused depression, temporary loss of memory, worsening of anginal pain (rare), and temporary diminution of renal function (not to the extent of azotemia, however).

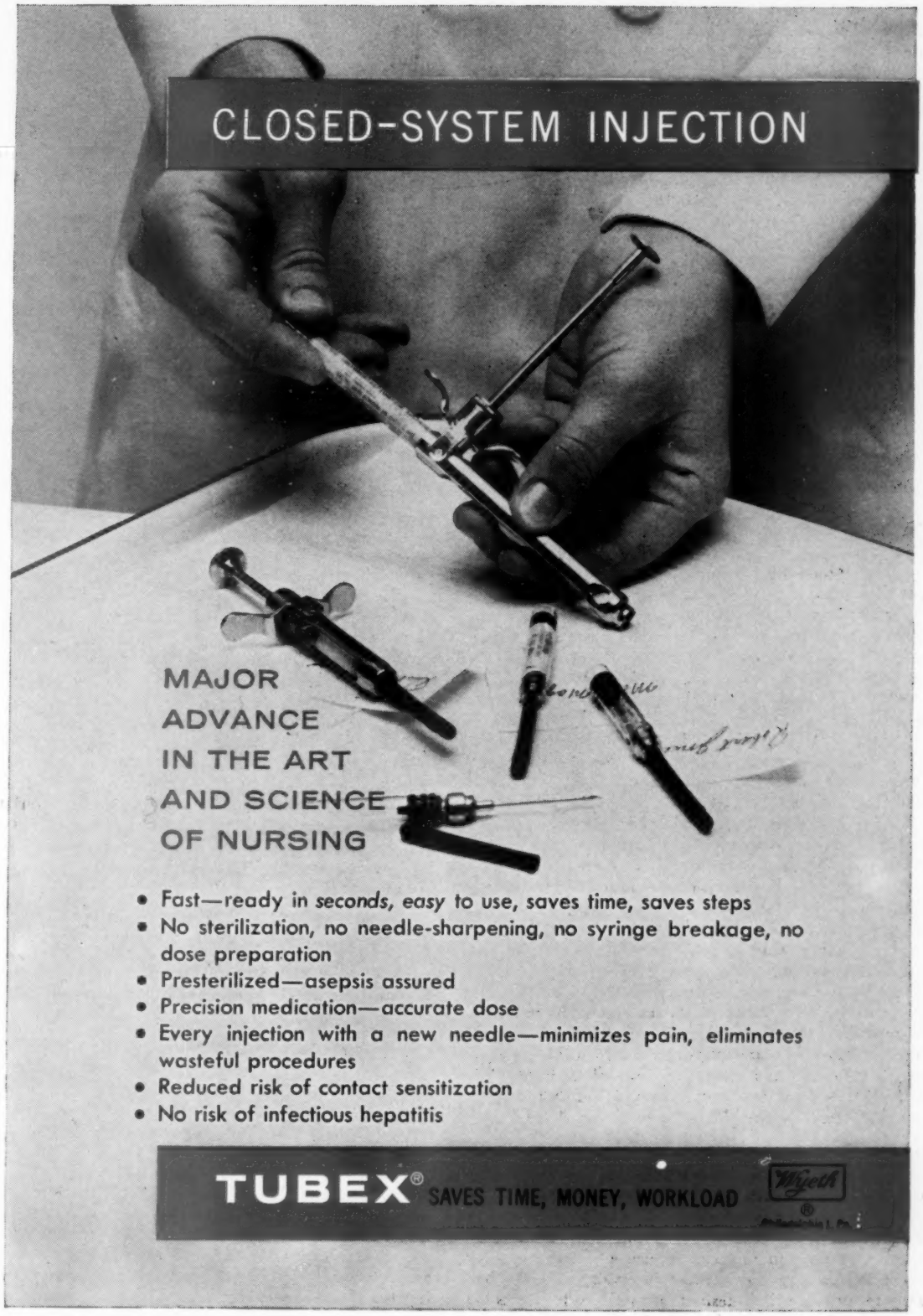
In the small and very seriously ill group of patients with true malignant hypertension that has progressed to the point of azotemia, hexamethonium has produced a fatal pulmonary disease characterized by fibrinous pneumonitis. Hexamethonium is the only autonomic blocking agent associated with this type of toxicity; moreover, the entity has become rare in the last 2 or 3 years, perhaps because other ganglionic blocking agents are more popular and control of hypertension is better achieved. Poor and intermittent control of hypertension has usually preceded pulmonary symptoms. Tachypnea, becoming worse in the sitting or standing position, is a cardinal sign. The microscopic lesions resemble those of "uremic pneumonia" despite the presence of only moderate azotemia (no more than 60 mg. of nonprotein nitrogen per 100 ml. of plasma) and the absence of clinical uremia. One patient may have recovered after treatment with cortisone.

In this same small group of very seriously ill patients with true malignant hypertension that has progressed to the point of azotemia, large doses of mecamylamine have produced a nonfatal, reversible disturbance characterized by generalized and severe coarse or flapping tremor that disappeared with sleep. Intense anxiety, sometimes with hallucinations, has also occurred. The syndrome resembles delirium tremens rather than Parkinsonism. Recovery has taken as long as 1 to 2 weeks after withdrawal of the drug and substitution of another agent.

Drugs Acting Directly on Vascular Smooth Muscle.—Hydralazine relaxes constricted vascular smooth muscle. Notable among its effects is an increase in renal plasma flow, reversing the hemodynamic profile accompanying hypertension. It is unique in that this action is duplicated only by pyrogens and pregnancy. Another important effect includes inactivation of pherentasin, the vasopressor polypeptide found in human hypertensive blood, and inactivation of hypertension of angiotonin, the vasopressor polypeptide resulting from the proteolysis of a plasma globulin by renin from the kidney. It is likely that pherentasin is activated human angiotonin. In vitro, hydralazine inhibits at least one decarboxylase, that of dihydroxyphenylalanine, and stimulates monamine oxidase, the ubiquitous enzyme that can deaminate many substances with vascular and cerebral actions such as hypertensin, pherentasin, serotonin, levarterenol, epinephrine, tyramine, and tryptamine. Some of these are the products of amino acid decarboxylation. Hydralazine is also a strong chelating agent for some trace metals. In these respects its actions on the humoral nephrogenic mechanisms of hypertension are ideal, as it causes vasodilatation, increased renal blood flow, and both diminished production and increased destruction of vasoactive substances found or suspected in blood. Hydralazine should therefore be a basic medicament in all forms of the disease in which a nephrogenic, humoral influence is present. It must be given in large doses to patients in whom this influence is great.

There are unwanted and undesirable actions of the drug. Histaminase is inhibited in vitro; some of the symptoms that appear when hydralazine is given, including headache, flushing, aching, edema of the skin, and nasal stuffiness, may be attributed to failure of destruction of histamine. Mild chemosis is common; tachycardia is produced, but it may be inhibited by drugs given adjunctively that act on the nerves. Occasionally drug sensitivity with fever, aching, and flulike symptoms appears. In a few individuals the drug cannot be used at all.

Late toxic reactions generally are confined to a syndrome simulating disseminated lupus erythematosus, characterized usually by arthritis or arthralgia in the early stages, with malaise, lassitude, and weakness. Splenomegaly, hepatomegaly, and lymphadenopathy are sometimes seen; evidence of disturbance of circulating protein levels is almost always found, with increased cephalin cholesterol flocculation and thymol turbidity of serum and hyperglobulinemia. Leukopenia and anemia have been seen and the L. E.-cell preparation of blood eventually becomes positive. If administration of the drug is discontinued, these symptoms and findings regress and disappear; if not,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symptoms may subside only to recur. The main organic change is progressive renal dysfunction with azotemia, which does not, in our experience, regress or progress after the drug has been omitted. This syndrome has been reproduced in dogs, with the appearance of "wire-loop" lesions of glomeruli. "Hydralazine disease," which occurs in 8 to 10% of individuals, is rarely seen in patients taking 0.4 gm. a day or less. It develops in 5 months to 4 years, cannot be made to develop deliberately by very high doses, and is completely, if slowly, reversible when administration is discontinued. The phenomenon resembles a syndrome of depletion in many respects and one of hypersensitivity in others. By reducing the dosage slowly and carefully after 6 months of therapy to 0.4 gm. a day or less, this high rate of reaction can be lowered. By no means does it negate the use of this valuable drug. Furthermore, it stimulates research and development of analogous substances, among which are many experimental compounds that chelate or bind trace metals. Thiocyanate, nitroprusside, azides, and dimercaprol (BAL) have been used in man; many other binding agents have been tried in hypertensive animals. Other compounds that act on constricted vascular smooth muscle and destroy hypertensin and pherentasin but are less toxic are sorely needed.

Agents and Methods Affecting Vascular Smooth Muscle by Interfering with Salt-Steroid Relationships. —No drugs are available as yet that will compete with aldosterone (11β-21-dihydroxy-3,20-diketo-4-pregnene-18-al) or other salt-retaining hormones and therefore depress the reactivity of vascular smooth muscle; however, experimental agents that will do this have been synthesized. Until specific antialdosterones are found, the only recourse is dietary restriction of sodium. The restriction must be strict and considerable, to 0.5 gm. of salt per day, a regimen difficult to achieve for the average patient.

The physician should understand what he is doing when salt is restricted. The kidney of a patient with hypertension, even in the mildest stages, loses salt. The effect of salt restriction is to cause overactivity of the zona glomerulosa of the adrenal cortex. The expected result is excessive production of aldosterone, just as this hormone is produced in salt-retention states such as edema. Because salt-retaining hormones plus sodium ion apparently sensitize vascular smooth muscle to vasoconstrictor substances and impulses, removal of either may negate excessive sensitivity, but removal of sodium may cause overproduction of the other. Too severe salt depletion will lead to the low-salt syndrome, with renal insufficiency and death. Thus salt restriction of a degree sufficient to lessen vascular reactivity must be carefully achieved in order to avoid both insufficient and excessive loss of sodium. The relatively few fatal reactions observed indicate that the error is largely on the side of insufficient depletion.

Methods of Administration

The use of potent hypotensive agents cannot be haphazard, intermittent, or careless. There is no better method for producing intractable tolerance to their actions in severe hypertension than by discontinuous, uneven therapeutic pressure. Once started, they must be given at regular intervals, in doses adequate to produce the desired effects. Side-effects are treated as they arise; with ganglionic blocking agents they are averted before they appear by the use of laxatives and parasympathomimetic drugs.

The aim of therapy is to cause mean diastolic normotension or, failing that, a reasonable facsimile thereof. Compromises with normotension result in compromises with the disease. The upper limit of diastolic normotension is defined as 90 mm. Hg. To achieve it requires education of the patient, a physician familiar with the pharmacological actions of various drugs, duration of action and side-effects, and careful instruction in self-medication. It also requires data on levels of blood pressure, secondary effects of the disease, and progress of the patient. Failing that, control is erratic and hazardous. No attempt is made to achieve systolic normotension (140 mm. Hg) in patients with severely atherosclerotic aortas.

The *sine qua non* of effective therapy of chronic generalized vasospasm is to use one agent acting on neurogenic vasoconstrictor mechanisms and one agent acting on vascular smooth muscle. No single drug combines these two actions.

Milder forms of the disease respond to milder measures, more severe forms to more potent drugs and vigorous measures. Unfortunately, the durations of action of all of the orally effective available ganglionic blocking agents are short, 4 to 6 hours, and they must be given at these intervals. When one of the hypertensive mechanisms, either the neurogenic or nephrogenic, is blocked, the other appears to "overshoot" or become hyperactive. Thus, in severe cases, and even in less severe ones, both types of agents are essential for control.

In milder cases, when hypertension is present upon examination by a physician and during emotional stress but is probably absent during sleep and relaxation, reserpine alone, 0.1 to 0.5 mg. given orally per day, may be tried for a month or two. If this is not effective, hydralazine hydrochloride is added in doses of 25 mg. four times a day, increasing at weekly intervals until 300 or 400 mg. per day is given. The maximal effect can be observed in one to three months. This method is justifiable only when the physician is relatively certain that a cardiovascular accident will not occur in that interval or that renal deterioration is not present and progressive. A false sense of security may be engendered by the very fact of treatment, even though treatment is inadequate or useless.

In more severe cases, those in which hypertension does not respond completely to sedation, relaxation, bed-rest, or sleep induced by amobarbital (Amytal) sodium, or in patients with persistent hypertension leading to cardiovascular accidents, ganglionic blockade and hydralazine are indicated. Ganglionic blockade is initiated more safely and easily in the hospital.

Blood pressure is measured by competent nurses every 4 hours, day and night, and charted. The choice of a ganglionic blocking agent is a matter of individual preference. Hexamethonium chloride (125 mg.), pentolinium tartrate (20 mg.), chlorisondamine chloride (12.5 mg.), or mecamylamine hydrochloride (2.5 mg.) are given orally every 4 hours around the clock. In order to avoid undue intermittent hypotension, doses are omitted if the systolic pressure is below a chosen level, usually 140 mm. Hg for younger individuals and 150 or 160 mm. Hg for those with atherosclerosis of the aorta, cerebral thrombosis, or ischemic manifestations caused by local atherosclerosis. Some physicians take the blood pressure with the patient supine, whereas others take advantage of postural effects and measure it with the patient seated.

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Measurement with the patient in the standing position should be avoided, for falsely low values and insufficient doses will result. Laxatives should be given as needed to prevent constipation and the consequent danger of paralytic ileus in patients receiving ganglionic blocking agents by mouth.

The dose of ganglionic blocking agent is raised every day by increments similar to the initial dose until fluctuations to normotensive pressures occur. In the usual case of moderately severe hypertension, 500 mg. of hexamethonium chloride, 100 mg. of pentolinium tartrate, 50 mg. of chlorisondamine chloride, or 10 mg. of mecamylamine hydrochloride every 4 hours is sufficient to produce this effect, although twice these doses occasionally becomes necessary. Rarely is normotension (mean pressure, 140/90 mm. Hg or below) achieved and maintained by these drugs when used alone, partly because of irregular absorption, rapid elimination, and increasing tolerance.

If protoveratrines A and B are preferable, an initial dose of 0.5 mg. is given three or four times daily during the day and increased daily by 0.5 mg. at first and then by 0.2 mg. until nausea or vomiting occur. The dose is then reduced by 0.2 mg. Patients vary considerably in their reactions to this agent; since there is some carry-over from one dose to another during the day, the morning dose will be relatively high (2 mg. or more), the noon dose less (1 mg.), and the evening dose greater or less. The production of fluctuations to normotensive levels at doses less than those causing nausea is the aim; each dose is critical in this respect.

At this point 25 mg. of hydralazine hydrochloride is administered every 4 hours. At daily intervals this dose is successively doubled, tripled, and finally quadrupled. If normotension is not achieved, the dose of blocking agent or hydralazine is increased, depending upon clinical judgment and findings as to whether neurogenic or nephrogenic influences are greater. In unusual cases of sensitivity, this drug cannot be used. During the appearance of sustained normotension or considerable fall in blood pressure, the patient often complains of weakness, lethargy, lassitude, prostration, and poor memory. He then needs encouragement, for these symptoms pass in a few days or weeks.

Before the patient leaves the hospital, the night dose is omitted and blood pressure is measured always with the patient sitting. Doses of blocking agents automatically adjust themselves downward by this procedure, although higher levels are usually found in the morning because the agent is excreted during the night. The patient is taught to take and record his own pressure and is discharged from the hospital to continue on five doses of blocking agent and hydralazine per day, the former on a sliding scale depending upon prevailing levels of systolic pressure. The effective dosage of ganglionic blocking agents is usually less during warm weather. The rationale and limits of therapy are carefully explained. In our experience, only rarely is a patient made nervous or neurotic by self-medication and self-measurement; on the contrary, a sense of relief and freedom from anxiety is provided him by learning that he can lower his blood pressure by a tablet.

If data are adequate (frequent readings of blood pressure) and suggest a reduced drug requirement, after 6 months of therapy in some cases and after a year in others, the doses may be decreased to four times a day. A rise in the mean pressure level during the next week or two requires readjustment of the dose upward. After 2 or 3 years, especially when little ganglionic blocking agent is needed, the amount of hydralazine hydrochloride may be lowered slowly to very small quantities, 25 mg. per day, or even omitted. If, however, diastolic normotension is not achieved, no reduction in dosages is advisable.

Withdrawal of both drugs, unless by gradual decrements as described, results in a return of hypertension. If the patient formerly exhibited the malignant stage (hemorrhagic and exudative retinitis, papilledema, high fixed diastolic pressure, and renal damage), that stage may return abruptly in a day or two, with subsequent deterioration and death resulting from a cerebral vascular accident or an episode of congestive heart failure. If a patient is once committed to therapy, therefore, he should continue until it no longer becomes necessary. Whether or when that time will arrive cannot be foretold.

There are alternate choices of combinations of these drugs and methods, suitable for individual cases. Ordinarily, none of these drugs will give an optimal result when used alone; however, a drug or measure acting on autonomic nerves can be combined with one acting on vascular smooth muscle with additive results. Thus, reserpine, surgical sympathectomy, or ganglionic blockade can be satisfactorily added either to dietary restriction of salt or to hydralazine. In our experience, the combination of two measures in the first group provides erratic control, while the combination of two in the second is little more effective than either one alone.

The potencies of the different drugs and combinations of drugs in counteracting generalized vasospasm can be expressed briefly as follows from mildest to strongest: reserpine, reserpine plus hydralazine, protoveratrines A and B, chemical ganglionic blockade, protoveratrines A and B plus hydralazine, and ganglionic blockade plus hydralazine. If a strict low-sodium diet (0.5 gm. of sodium chloride per day) can be attained, its effect can be considered approximately equal to that of hydralazine alone; therefore, it may be substituted for hydralazine in any one of the previously mentioned combinations. Hydralazine alone is seldom given unless surgical sympathectomy has been performed.

From the foregoing data, it is obvious that the use of a single capsule or tablet containing a combination of two or more potent agents is unduly restricting and may even be hazardous. Each type of drug acts upon a different area, and the dose must be adjusted to suit the individual. Regarding side-effects of ganglionic blockade, this is one of the rare examples in which one is justified in setting one pharmacological thief to catch another; however, a blocking agent combined with a standard dose of neostigmine (Prostigmin) or bethanechol (Urecholine), for example, given in varying doses, might be expected to cause unpredictable results. These combinations of two oppositely acting drugs are avoided. Furthermore, there is no more justification for giving reserpine, a drug with prolonged action, in slowly released doses from a capsule, than there is in giving digitalis in such a preparation. Each agent is given for its specific action in the dose that will produce the desired effect without undue toxic effect.

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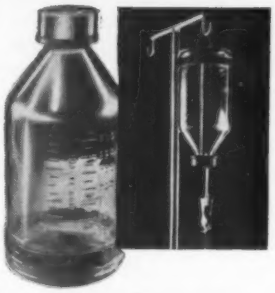

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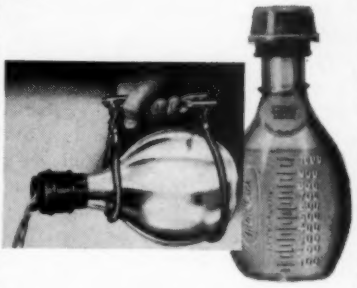

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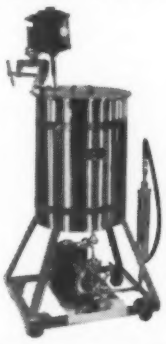

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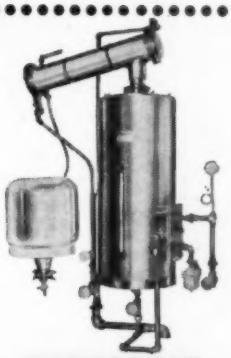

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Summary

Modern drugs and methods provide a relatively safe and effective, though difficult, form of therapy for combating the excessive vasospasm to which arterial hypertension is secondary. Undesirable side-effects are common to all. If the drugs are to be used to their best advantage, a physician familiar with their primary actions and side-actions and a patient educated in their use are essential. Prolongation of life, lessening of cardiovascular-renal accidents and deterioration, and regression of the basic disease have been demonstrated. No patient need live with hypertension if he is willing to endure the inconveniences of therapy.

This study was supported by a grant-in-aid from the National Heart Institute, U. S. Public Health Service, and the Lasdon Foundation.

—*J. Am. Med. Assoc.* *162*:1382 (Dec. 8) 1956.

Report to the Council

The Council has authorized publication of the following report. Nonproprietary terminology is used for drugs that are mentioned; when such terminology is not considered to be generally well known, its initial appearance is supplemented by parenthetic insertion of names known to be applied to commercial preparations.

H. D. KAUTZ, M.D., *Secretary*

Syphilis

Current Status of Therapy

EVAN W. THOMAS, M.D., ALBANY, N. Y.

The therapeutic agent of choice for all types of syphilis is penicillin, unless a patient is sensitive to penicillin, in which case other antibiotics may be used. The Treponema pallidum is extraordinarily sensitive to penicillin. No proved penicillin-resistant strains of the organism have been found. As a rule, relatively low blood concentrations of penicillin, sustained for 7 to 10 days in early and latent syphilis and for 10 to 20 days late in symptomatic cases, are sufficient to cure or permanently arrest the infection. Rarely, a patient may require more intensive treatment with preparations that provide higher blood concentrations of penicillin sustained over a longer period than is needed for the great majority of patients. Reasons for this are obscure, but it is possible that in rare cases penicillin is absorbed poorly from muscle depots. Whether or not this is true, increasing the total dosage of penicillin for the treatment of syphilis in relatively large series of patients beyond the amount found to be effective in the great majority of cases has not significantly lowered the number of patients who had to be retreated. Consequently, in the routine treatment of syphilis, there seems to be little reason to exceed total dosages of penicillin that have proved to be adequate in 85 to 95% of cases.

The treatment schedules advised in this article are minimal. They are based on experience with relatively large series of cases that have been followed up for at least two or more years after therapy. It must be recognized, however, that by far the largest series of patients with such a follow-up were treated with penicillin preparations that preceded benzathine penicillin G (Bicillin; Permapen). The advantages of this new preparation are so great that it cannot be omitted from any discussion of modern antisyphilitic therapy. Despite the relatively meager data on prolonged follow-up of patients treated with this very slowly absorbed preparation, it promises to supersede other types of penicillin in the treatment of syphilis. A single treatment with 2,400,000 units of benzathine penicillin G provides demonstrable blood concentrations of penicillin for at least 15 days. Because of the slow absorption, blood levels of penicillin are low but sufficiently high for the treatment of most cases of syphilis, with the possible exception of relapses and infections of the cardiovascular and central nervous systems.

Venereal Disease Consultant, New York State Department of Health.

Classification of Syphilis

In outlining the treatment of syphilis, the disease can be classified into three main divisions: (1) early symptomatic syphilis, which includes the primary and secondary stages; (2) latent or asymptomatic syphilis diagnosed solely by serologic tests and history; and (3) late symptomatic syphilis.

Latent syphilis has long been classified as early or late. Early latent syphilis is defined by some authorities as an infection of less than 2 years' duration and by others as one of less than 4 years' duration. Which definition is chosen depends upon how long one believes the immunologic status of early syphilis lasts. Actually the duration of this status probably differs greatly in different individuals, and, for the purpose of treatment, there is no reason to believe that either early or late latent syphilis requires more or different therapy than does secondary syphilis. However, in evaluating the results of therapy, it has been found that early latent syphilis of less than one year's duration usually becomes seronegative after treatment much more rapidly than does latent syphilis of longer duration.

Treatment Schedules for Primary and Secondary Syphilis

A single treatment with 2,400,000 units of benzathine penicillin G is advised for routine treatment of early symptomatic syphilis. This dosage is best given by an injection of 1,200,00 units (4 cc.) in each buttock. A single injection of 4 cc. of a preparation containing 600,000 units per cubic centimeter can be given, but this concentrated suspension has caused incapacitating pain at the site of injection in some individuals. Smith and Shafer and co-workers of the U. S. Public Health Service have reported as good results with a single treatment of 2,400,000 units of benzathine penicillin G as with 4,800,000 units or more of procaine penicillin G in oil and aluminum monostearate given in divided doses over 7 to 21 days. Their findings are based on the follow-up of a series of 196 cases.

If procaine penicillin G in oil and aluminum monostearate is used, the advised dosage is 4,800,000 units given in divided doses of 1,200,000 units at intervals of 2 to 7 days. No advantage has been found in giving individual doses smaller than 1,200,000 units, and some data suggest that better results have been obtained when injections were given at intervals of 2 to 4 days than at longer intervals.

Evaluation of Treatment of Primary and Secondary Syphilis

Quantitative serologic tests for syphilis are of great help in the follow-up of patients treated for early symptomatic syphilis. Seronegative primary cases may become seropositive immediately after therapy, but the tests should again be negative within a month after successful therapy. Cases of primary or secondary syphilis seropositive at the time of treatment should show definite drops in titers within 6 months after successful therapy. Complete seronegativity may not be obtained

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CHILDREN—5 to 7 mg. per Kg. (2.2 to 3.1 mg. per lb.) per 24 hours.

SUPPLIED: Tablets, 50 and 100 mg. Oral Suspension (25 mg. per 5 cc. tsp.).

*Stewart, B. L., and Rowe, H. J.: J. Am. M. Ass. **160**:1221, 1956.

EATON LABORATORIES, NORWICH, NEW YORK

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for a year or more, but as long as the drop in titers to low levels is maintained, re-treatment is unnecessary. Available data on large series of patients indicate that 20% or more with secondary syphilis remain seropositive in low titers (positive in dilutions of 1 to 2 or less) for 1 to 5 years after successful treatment.

Re-treatment is indicated when a rise of titers from previous levels occurs or when clinical relapse is evidenced by lesions of the skin or mucous membranes. In the absence of clinical relapse, a single rise in titers from previous levels should always be confirmed by repeated tests. When serologic titers are determined at weekly or monthly intervals, it is not unusual to find that increases in the titer of a single test are not sustained at subsequent tests. Relapse or reinfection is associated with rapid and marked increases in titers.

As a rule, a reinfection requires no more treatment than an original infection, but a relapse should be treated more intensively with procaine penicillin G in oil and aluminum monostearate rather than with benzathine penicillin G because of the higher concentrations of penicillin obtained with the former preparation.

Treatment Schedules for Latent Syphilis

When diagnosis of latent syphilis is made, asymptomatic neurosyphilis should be ruled out by spinal fluid examination and cardiovascular syphilis by fluoroscopic examination or teleroentgenography. No good evidence exists that latent syphilis, early or late, requires more treatment than does secondary syphilis; therefore, the treatment schedules advised for secondary syphilis may be used for latent cases.

When the diagnosis is doubtful, because of failure to obtain a spinal fluid examination or to rule out cardiovascular involvement, a single treatment with 2,400,000 units of benzathine penicillin G would probably be effective for most patients with asymptomatic neurosyphilis; however, available data are insufficient to decide this question one way or the other. When in doubt, a total dosage of 6 million units of procaine penicillin G in oil and aluminum monostearate given in doses of 1,200,000 units at intervals of 2 to 7 days should provide sufficient therapy for patients with asymptomatic involvement of the central nervous or cardiovascular systems.

Evaluation of Treatment of Latent Syphilis

A noticeable and relatively rapid decline in serologic titers during the first 6 months after successful treatment can be expected when early latent syphilis has been present for less than one year. When the infection has been present for more than one year, prolonged persistence of seropositivity is the rule. Relatively high titers usually decline within one year after treatment, but occasionally it is impossible to obtain low titers by any regimen of treatment. Persistence of positive serologic tests for syphilis for years after treatment of late latent or late symptomatic syphilis does not necessarily mean a continuation of the infection. Treatment for the sole purpose of obtaining negative titers is usually futile.

Indications for re-treatment are the development of symptoms attributed to syphilis or of sustained increases in serologic titers from previous levels. Development of the latter must be determined with caution. Titers are determined by diluting the serum. They are usually reported as positive in undiluted serum or in dilutions of 1:2, 1:4, 1:8, 1:16, and so forth. The practice of doubling the dilution at each successive step may be disconcerting to the physician unless this is understood. A reported titer of positive in dilutions of 1:16 might be positive in dilutions of 1:32 in a subsequent test without the increase being significant; a later test might again be reported as positive in dilutions of 1:16. To be significant, an increase in reported titers should be more than one step in the dilutions and the increase should be sustained for several months before re-treatment is given. In a prolonged follow-up of treated patients, it is not unusual for reported titers to fluctuate at times between lower and higher levels.

Treatment of Late Symptomatic Syphilis

No data are as yet available on the follow-up of significantly large series of patients treated for late symptomatic syphilis with benzathine penicillin G. If this preparation is used, it seems advisable to give at least three treatments of 2,400,000 units at intervals of no more than 7 days. The purpose of this treatment is to increase the concentration of penicillin within the body rather than to prolong the duration of treatment.

Good results have been obtained in the treatment of neurosyphilis with procaine penicillin G in oil and aluminum monostearate. Serial spinal fluid examinations afford means, which are unavailable in cardiovascular syphilis, of evaluating treatment of this complication. On the basis of spinal fluid examinations, total dosages of 6 to 10 million units of this form of penicillin are sufficient for over 90% of all types of neurosyphilis, including paralytic dementia and primary optic atrophy. This does not mean that symptoms caused by irreversible changes in nervous structures can be relieved or that far-advanced cases of primary optic atrophy may not progress to blindness. The time to treat syphilis is before such advanced pathological changes have occurred.

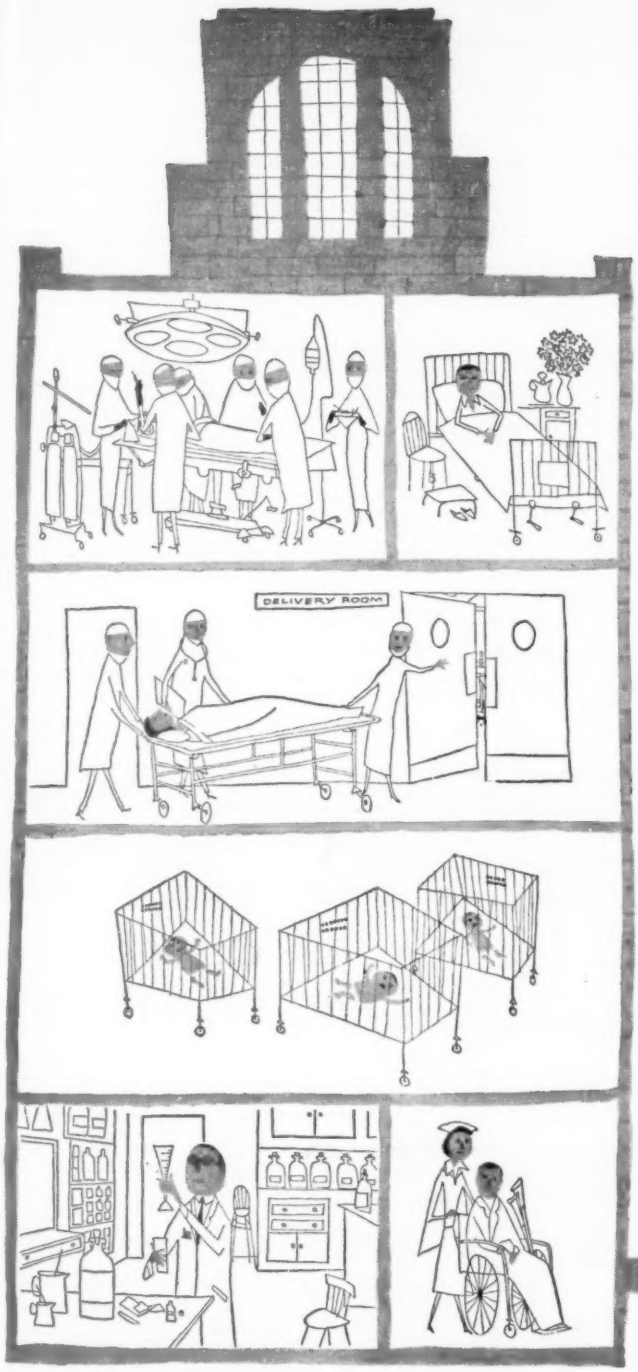
By analogy with neurosyphilis, treatment with 6 to 10 million units of procaine penicillin G in oil and aluminum monostearate can be advised for all types of late symptomatic syphilis. Individual doses, consisting of 1,200,000 units, may be given two or three times a week.

Evaluation of Treatment of Late Symptomatic Syphilis

As is true of late latent syphilis, treatment of late symptomatic syphilis is not followed in most patients by seronegativity within 10 or more years. Regardless of the kind, amount, and duration of therapy, 70% or more of large series of patients treated for late latent and late symptomatic syphilis have been seropositive 10 years after treatment.

Re-treatment is advised when titers increase significantly from previous levels and the increase is sustained for several months. Even in the absence of increased serologic titers, progression or relapse of symptoms and signs attributed to syphilis may be an indication for additional therapy, but it is by no means true that active syphilis is always the cause of such presumed progression. Causes other than syphilis may adversely affect tissues already severely injured by syphilis that has been inactivated by treatment.

The best guide to the activity of neurosyphilis is serial spinal fluid examinations performed at 6-month intervals. Pleocytosis (lymphocytes and other mononuclear cells in the spinal fluid) in association with positive specific tests for syphilis in the spinal fluid indicate disease activity. After treatment, cell counts should be less than 4 per cubic millimeter within 6 months to a year; high total protein content of the



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spinal fluid at the time of treatment should decline within a similar time, but the total protein determinations may not be within normal limits for a year or more. High titers of specific tests for syphilis in the spinal fluid at the time of treatment should show a decline within one year after treatment, but the tests generally do not become negative for years. Relapse of neurosyphilis is indicated by the reappearance of increased cell counts and frequently by increases in the total protein and in quantitative specific tests for syphilis in the spinal fluid. Titers of the blood serologic tests may or may not increase in the presence of relapsing neurosyphilis.

Unfortunately, a word of caution regarding the reports of cell counts, total protein values, and colloidal gold tests of spinal fluid is necessary. Unless these tests are made with reasonable accuracy and consistency, the reports may be more confusing than helpful. In the absence of complete and reliable spinal fluid examinations for neurosyphilis, patients might well be spared the ordeal of repeated spinal punctures. On the basis of experience at Bellevue Hospital in New York City where spinal fluid examinations were made by specially trained personnel, 6 to 9 million units of penicillin, acting over 15 to 20 days, should inactivate neurosyphilis in over 90% of patients.

Treatment of Syphilis in Pregnancy

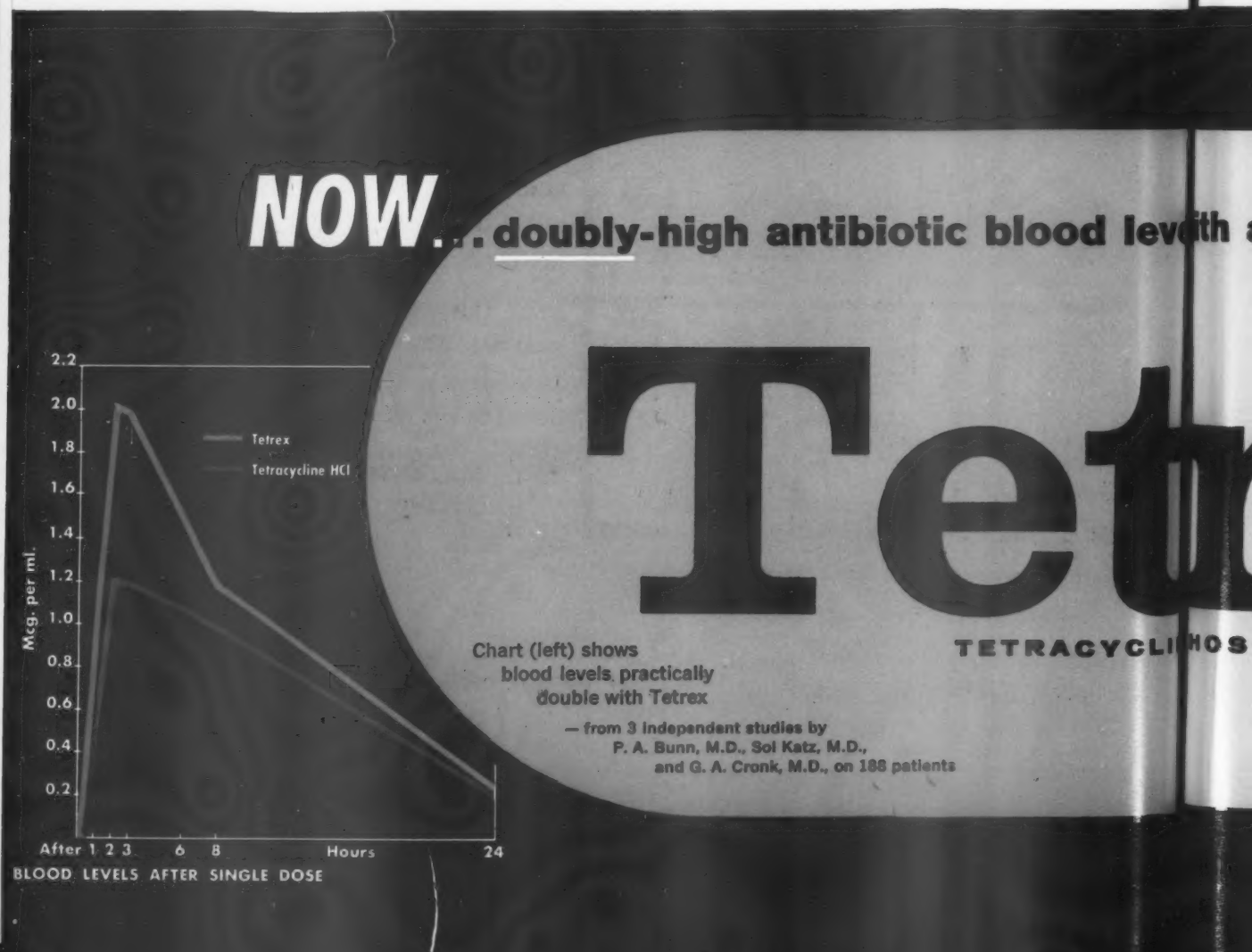
Syphilis in pregnant women requires no more or different therapy than in nonpregnant women. The question always arises as to whether the woman who has acquired syphilis should be treated in each succeeding pregnancy. In general, available data indicate that this is unnecessary, provided the woman has received previous penicillin therapy with no subsequent evidence of relapse or reinfection. When there is doubt about the adequacy of previous treatment, a single treatment with 2,400,000 units of benzathine penicillin G or four injections of 1,200,000 units of procaine penicillin G in oil and aluminum monostearate should be given during pregnancy. When syphilis is discovered very late in pregnancy, it is always advisable to treat it as soon as possible. Even when treatment is given only a few days before delivery, the fetus may benefit by the therapy as penicillin crosses the placenta to the fetus.

Treatment of Congenital Syphilis

Congenital syphilis can be treated in the same way as acquired syphilis except that smaller doses should be used in children weighing under 32 kg. (70 lb.). Infants and children should receive total doses of 75,000 to 100,000 units of penicillin per kilogram of weight. Procaine penicillin G in oil and aluminum monostearate in doses of 0.5 to 1 cc. (150,000 to 300,000 units) may be injected every 2 to 4 days until the total dosage is completed.

Substitutes for Penicillin

Antibiotics other than penicillin may be used to treat syphilis in patients sensitive to penicillin. Oxytetracycline



hydrochloride (Terramycin Hydrochloride), chlortetracycline hydrochloride (Aureomycin Hydrochloride), chloramphenicol (Chloromycetin), erythromycin (Erythrocin, Ilotycin), erythromycin stearate (Erythrocin Stearate), and carbomycin (Magnamycin) are effective antisyphilitic agents. Data on their use are limited, the greatest experience having been with the first two. Turner and Schaeffer have recently reported that, in the laboratory, T. pallidum is more sensitive to erythromycin and carbomycin than to any of the other antibiotics except penicillin.

It is doubtful that minimal effective dosages of the antibiotics other than penicillin have been determined. From the available data, it appears that early and latent syphilis should be treated orally with at least 3 to 4 gm. daily of oxytetracycline hydrochloride or chlortetracycline hydrochloride for 10 to 12 days. Individual doses of 0.75 to 1 gm. every 6 hours are advised. Late symptomatic syphilis, especially neurosyphilis and cardiovascular syphilis, should be treated with similar doses for at least 15 days. The Mayo Clinic achieved excellent results in the treatment of neurosyphilis with 50 to 90 gm. of chlortetracycline hydrochloride. In giving such large doses, every effort must be made to avoid gastrointestinal symptoms; however, antibiotics should always be preferred to treatment with arsenicals and bismuth. Despite the lack of conclusive data on the use of carbomycin, treatment might well be tried with 2 to 3 gm. of this antibiotic given daily for periods previously suggested.

Summary

A single treatment with 2,400,000 units of benzathine penicillin G can be used for the routine therapy of early and latent syphilis. If procaine penicillin G in oil and aluminum monostearate is used, routine therapy should consist of 4,800,000 units with individual injections of 1,200,000 units every 2 to 7 days. Valid data on the effects of treating late symptomatic syphilis, especially neurosyphilis and cardiovascular syphilis, with benzathine penicillin G are as yet unavailable, but three treatments with 2,400,000 units, with no more than 7 days intervening between each treatment, have been recommended. Good results in the treatment of late symptomatic syphilis have been obtained with total doses of 6 to 10 million units of procaine penicillin G in oil and aluminum monostearate. Individual doses of 1,200,000 units should be given two or three times a week. Patients with syphilis who are sensitive to penicillin can be treated with oxytetracycline hydrochloride, chlortetracycline hydrochloride, erythromycin, or carbomycin. Available data are confined to the first two. Minimal schedules with oxytetracycline hydrochloride or chlortetracycline hydrochloride consist of 3 to 4 gm. daily given in divided doses of 0.75 to 1 gm. every 6 hours for 10 to 12 days in early and latent syphilis and for at least 15 days in neurosyphilis and cardiovascular syphilis. Preliminary reports suggest that carbomycin in daily doses of 2 to 3 gm., for the same periods as advised above, may be effective.

—*J. Am. Med. Assoc.* **162**:1536 (Dec. 22) 1956.

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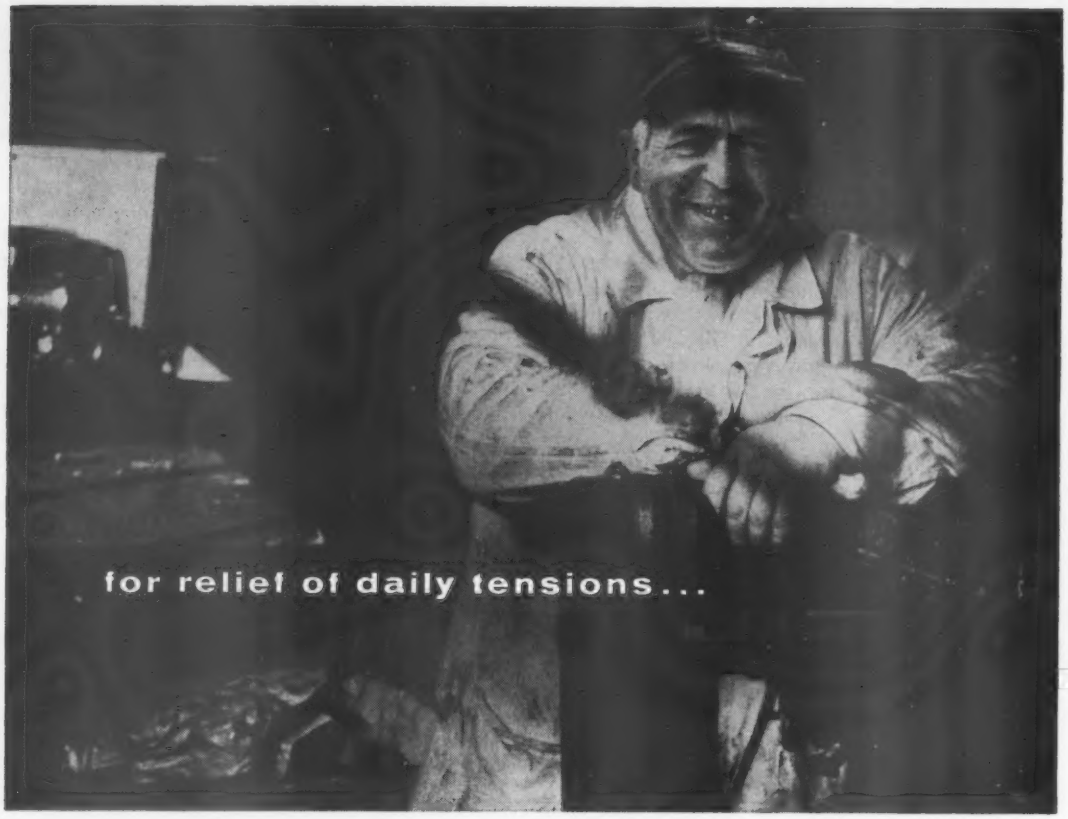

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*Ferguson, J. T.: J. Am. Geriatrics Soc. *4*:1080, 1956.

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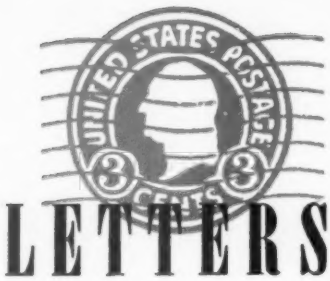

LETTERS

Appreciation

DEAR SIRS: I have read with interest in the November-December (1956) issue of THE BULLETIN the following two articles: "Antiseptics in the Hospital Pharmacy" George F. Reddish, and "Antibiotics Today."

It would be greatly appreciated if you would advise me if reprints of these two articles are available through your office, or it may be possible for you to supply a set of tear sheets. If the reprints are available, would you please indicate the cost of them so that I might place an order.

I would like to take this opportunity to thank you for your kind cooperation.

J. E. MATTHEWS, *Health Supplies Officer*
Civil Defense Health Services
Ottawa, Canada

DEAR SIRS: I have received two copies of the November-December issue of THE BULLETIN and I want to tell you how pleased and honored I am with your treatment of my article.

DAVID L. COWEN, *Chairman*
Department of History and
Political Science
Rutgers University
University College
New Brunswick, New Jersey

DEAR SIRS: I wish to thank you for the material which you sent me in August pertaining to the Pharmacy and Therapeutics Committee.

This material is of a great help in organizing my Committee which is still in the talking stage. However, I have crossed the first hurdle by establishing the need for such a Committee.

If it is possible would you please send me six more reprints of your article entitled "The Hospital Formulary." I believe it will be very instrumental in setting up the first meeting.

BILL SCHWAIGER, *Chief Pharmacist*
St. Rita's Hospital
Lima, Ohio

Information Requested

DEAR SIRS: . . . Do you have a standardized formula for aluminum paint as differentiated from aluminum paste?

CARL E. BECK, *Pharmacist*
Central Baptist Hospital
Lexington, Kentucky

EDITOR'S NOTE: If anyone has available a formula for aluminum paint, Mr. Beck may be reached at Central Baptist Hospital, 1740 South Limestone, Lexington, Kentucky.

Actions on Resolutions

DEAR SIRS: Thank you for your very gracious letter and for the resolution passed at the 1956 Annual Meeting of the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS.

It is of great help and encouragement to receive official recognition such as your group sent to us. The improvement of quality hospital care is a mutual problem of all of us. I am very happy and pleased with your letter.

Thank you for writing. Please convey my thanks to your group.

KENNETH B. BABCOCK, M. D. *Director*
Joint Commission on Accreditation of Hospitals,
Chicago 11, Illinois

DEAR SIRS: Thank you very much for your letter of September 28, 1956, containing the resolution on the WHO drug programs, adopted by the 1956 meeting of the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS.

The Public Health Service is very pleased to see this appreciation by the hospital pharmacists of the WHO drug programs.

I have sent copies of your letter to Dr. Marcolino G. Candau, Director-General of the World Health Organization, and to the Secretary of State for their information.

L.E. BURNEY, *Surgeon General*
Department of Health, Education, and Welfare.
Washington 25, D.C.

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EDITORIAL

Significance of Audit of Pharmaceutical Service

by Don E. Francke

Hospital pharmacists have an opportunity to contribute significantly to the future of their profession through active participation in the Audit of Pharmaceutical Service in Hospitals which is being conducted by the American Pharmaceutical Association and the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS under a grant from the Public Health Service. All chief pharmacists in hospitals with 100 or more beds were sent a questionnaire in March. If the results of the study are to be meaningful, it is essential that all hospital pharmacists cooperate by carefully filling out the questionnaire and returning it. The sooner the questionnaires are completed and returned, the more rapidly they can be coded, tabulated and analyzed.

We urge all hospital pharmacists receiving this questionnaire to make an important professional contribution by completing and returning it as soon as possible.

A high response rate from the questionnaire will provide accurate information in many important areas of hospital pharmacy practice. For example, it will indicate the number of hospital pharmacists in practice, the staffing pattern, and the area of floor space for pharmacies in hospitals of different sizes and types. Important information will be provided regarding policies and procedures. This will include information on procedures for checking prescriptions and orders to prevent errors in dispensing, the handling of investigational drugs, pricing, purchasing, etc.

To what extent is the hospital pharmacist a consultant to the physician and other members of the medical team? What types of information and special professional services are hospital pharmacists most often called upon to give? What methods do hospital pharmacists use to communicate with members of the medical staff and which do they find effective? Answers to these questions will be provided when the survey is completed.

Little information is available today concerning the workloads carried by pharmacists in hospitals of various sizes and types. One of the difficulties in obtaining information of this type is the lack of a uniform yardstick for measuring workloads. This represents an important area where the questionnaire will not yield adequate information and attempts will be made to obtain additional data through personal interviews.

One of the principal reasons for naming the pharmacist as Secretary of the Pharmacy and Therapeutics Committee of the medical staff was to place him in a position where he would have formal contact with the medical staff and thus to establish a direct line of official communication between the Pharmacy Department and the medical staff. Do hospital pharmacists neglect this opportunity and tend to utilize less formal, although admittedly important, methods of communication exclusively? What effect, if any, does this have on their professional status in the hospital? How active is the Pharmacy and Therapeutics Committees in hospitals and upon what does this depend? What are the procedures for obtaining drugs not stocked by the Pharmacy? Are these procedures fair and reasonable to the patient, the physician and the pharmacist—or are they characterized by needless delays and involved procedures? Answers to these questions, too, are important in a study of pharmaceutical service.

These are but a few examples of the type of information which will be provided by the study. Of special significance is the fact that the questionnaire has been so constructed that interrelationships between answers to the various questions can readily be shown. For example, relationships can be analyzed between the staffing pattern, size and type of hospitals, extent of professional service offered, methods of communication with the medical staff, purchasing policies, activity of the Pharmacy and Therapeutics Committee, teaching activities, etc.

All information furnished for the study is confidential as to its source. All hospitals lose their identity once the returns are tabulated and results will be reported by groups of hospitals of various sizes, types, etc.

This study will provide a wealth of information which will serve as a basis for numerous future plans and projects for the improvement of pharmaceutical service in hospitals in the interest of better patient care.

the use of Antiseptic Impregnation of Fabrics in the treatment & prevention of disease

by C. A. LAWRENCE *and* A. J. MAFFIA

MUCH WORK HAS BEEN DONE in the study of adding chemical agents to fabrics to prevent diseases, notably, upper respiratory infection, surgical and skin infection, and ammonia dermatitis.

It was felt important to review the literature and to re-evaluate the findings so that further use can be made of these facts.

During the past several years considerable attention has been directed to physical and chemical means for preventing, or limiting the spread of air-borne infections. For the main part these investigations were instigated because of the high incidence of cross-infections of the upper respiratory tract in contagious wards of hospitals and particularly in army camp barracks. Van den Ende, Lush and Edward[1,2] early found that hemolytic streptococci in blankets and bed-clothes would retain their virulence as long as four weeks from the time they were sprayed in the textiles. However, these workers were unable to show any germicidal action of woolens and cottons which were treated with various antiseptics and then experimentally sprayed with various microorganisms. Palmer and Blow[3], and Powney and Wood[4,5] used quaternary ammonium surface-active germicides (Quats) as vehicles for the de-

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position of mineral oil emulsions on wool fabrics. The latter investigators observed that these compounds would impart a positive electrical charge on the oil droplets in an oil-in-water emulsion. Harwood, Powney and Edwards[6] noted, moreover, that treatment of fabrics in a quarternary oil emulsion would cause a complete discharge of the oil phase in the negatively-charged cotton or wool textile, thereby leaving behind a clear water phase.

Control of Air-Borne Infections

Realizing the importance of controlling diseases of the respiratory tract and the general problem of air-borne infections, a special commission headed by Robertson was assigned by the United States Army to study this subject in the laboratory and in army hospital wards and barracks. In one of the first publications by Robertson and his group[7], the scope of the principles of the control of air-borne infections was reviewed. For the dust laying on highly polished floors and linoleum, use was made of a solution prepared from 5 percent urea, 3 percent of a nonionic wetting agent and 0.1 percent of a quaternary ammonium surface-active germicide (Quat). Reference was made in this report that the surfaces treated with the latter mixture "exerted a bactericidal action." While Robertson and his group used[8,9,10] a water-oil emulsion for the treatment of bedding, no mention was made of the use of a Quat in the emulsion for laundering purposes.

Although Van den Ende and his co-workers failed to show any advantage in the use of a Quat or other antiseptic agent for the treatment of bedding in hospital wards to reduce the incidence of air-borne infections, Rountree[11], the United States Medical Research Unit No. 1[12], and Schmeister and Greenspan[13] obtained encouraging results in the use of Quats for blanket impregnation. It was shown that when blankets were treated with 1:800 concentration of the germicide the streptococci were killed within a few hours exposure on the blanket. A reduction of at least 90 percent of the organisms was noted when the same blankets were tested for germicidal activity after being stored for 13 weeks.

Harris and Shure[14] used a water-and-oil emulsion as a spray for rugs, draperies and bedclothing in the bedrooms of patients sensitive to house dust. The Quat was added in minute amounts to the emulsion for its "fungicidal" action and also to prevent growth on wet fabrics during the 6 to 12 hour drying period. In all instances the patients with whom the studies were carried out were resistant to previous accepted methods of treatment, but showed dramatic relief of dust sensitization symptoms after spraying of the emulsion in this new technique.

Lawrence and Murphy[15] used Roccal® in the "germicidal" treatment of soiled clothes from the routine accumulation of several households in the final rinse of a commercially operated self-service laundromat. This study revealed that the second "deep-rinse" contained almost as many living bacteria as the first "deep-rinse." Using a concentration of approximately 1:5,000 Roccal® in either the first or last "deep-rinse," of approximately 7 gallons of water and 9 pounds of dry laundry, resulted in a marked reduction in bacterial population of the rinse-waters. Earlier experience of Lawrence also demonstrated that the mere

rinsing of cotton fabrics in appropriate aqueous solutions of Roccal® was sufficient to provide them with a definite germicidal action. The positive-charged Quat combines with the negative-charged fabrics in such a manner that the former becomes "fixed" on the latter, at the same time permitting a sufficient amount of "excess" amounts of the germicide to diffuse in nutrient broth or agar media to inhibit the growth of *Micrococcus pyogenes,* var. *aureus, Escherichia coli, Streptococcus pyogenes* and the fungus *Aspergillus niger.* Washing Quat-treated cottons in cold, warm, or boiling water fails to remove the antibacterial properties of the textile. Treatment with an anionic surface-active agent (true soaps, synthetic soaps) will, however, destroy the bactericidal properties of the Quats contained in the impregnated cloth.

Removal of Bacteria from Soiled Clothes

Arnold[16] early reported on the relative efficiency of laundry procedures in the removal of bacteria from soiled clothes and on the basis of his findings a number of standard procedures were outlined for the laundering of fabrics for the removal of micro-organism.[17] Barnes[18,19] and Heeren, Bradley and Taylor[20] later emphasized the potential hazards that existed for workers in launderies, who handle soiled bedding and clothing from individuals with infectious diseases. Probably one of the first reports on the recontamination of washed bedding is the publication by Church and Loosli[21]. These investigators found that in the routine laundering of fabrics in hospital or commercial launderies, the process was efficient in removing or destroying practically all of the organisms in the soiled linens or woolens. However, during the steps in extraction of the water in spin dryers, or while blankets were hanging to dry, they became highly contaminated by bacteria in the air from the environment of other activities in the laundry, i.e., sorting, etc. Although ironing at temperatures of 350°F. killed large numbers of bacteria, many of the organisms survived and were isolated from the finished laundered materials. Church and Loosli noted that the organisms most commonly found in the clean, laundered fabrics were nonhemolytic and alpha streptococci and *Micrococcus pyogenes,* vars. *aureus* and *albus.* Although no mention was made in their article of the use of "residual" sanitizers in the laundering process, these workers implied that the recontamination of washed bedding in the laundry should be considered a public health problem in that this may be the source of serious infections when the fabrics are again placed in use on hospital beds.

Poppe[22] in 1943 directed attention to the fact that surgical linens when wet by perspiration, irrigating solutions, or from the sterile water used in cleansing instruments, are a potential source of contamination when they come in contact with unsterile objects. He early advocated the use of a 1:1,000 solution of Zephiran®* to be used in the wash basins to avoid some of these sources of contamination. Propst[23] also discussed the potential hazards of bacterial infections that may result from wet surgical linen (perspiration, water, etc.) as compared to dry linens where no germicidal agent is used in the laundering process. Experimental and clinical studies revealed that the use of 1:2,500 Roccal® in the final rinse was effective in preventing the development of experimentally inoculated plates of *M. pyogenes,* var. *aureus* in the areas containing sections of the treated fabrics. Analysis of the linen also revealed that an appreciable amount of the Quat was retained in the fabric to account for its inhibiting action.

Baker, Madden and Hartz[24] found as little as 1:5,000 of Diaparene® Chloride** in the laundry rinse water was effective in reducing the contamination of surgical linen. Only 5 of 47 (10.6 percent) of the impregnated shirts were found contaminated. This was in contrast to 20 to 47 garments (42.5 percent) contaminated in the untreated group. Reference was made in this publication that no toxic or allergenic reactions were noted upon wearing the Quat-treated garments. Furthermore, *M. pyogenes* vars. *aureus* and *albus* were found as the major contaminants in shirts which were moistened by the skin.

Marsh and Rodway[25] made bacteriological samplings of air and dust in a maternity hospital where a 1:200 solution of Fixanol C® was used in the final laundering of blankets. When blankets were recently treated and used in the wards, the air samples during bed-making showed 75 colonies as compared to 180 in wards using untreated blankets. They noted, moreover, that the bacterial counts remained low for 3-4 weeks in the wards that were constantly using Quat-treated blankets. Laboratory tests of fibers of the treated blankets showed 10 to 20 millimeters areas of inhibition around them in agar plates inoculated with *M. pyogenes* var. *aureus.* As an adjunct to the measures used in the treatment of blankets, Marsh and Rodway found that a further reduction in bacterial counts of air in the wards could be achieved by spraying the mattresses and pillows with formalin.

*Brand of alkyldimethylbenzylammonium chloride
**Brand of diisobutylcresoxyethoxyethyldimethylbenzylammonium chloride

Prevention of Diaper Rash

Benson and his co-workers[26,27] were first to describe a new treatment for diaper rash which involved the use of Diaparene® Chloride in the final rinse in the laundering of diapers. Diaper rash is an ammonia dermatitis most often resulting from the bacterial decomposition of urinary urea to give free ammonia. The latter condition is due to the action on urine by saprophytic organisms such as *Bacterium ammoniagenes* (*Alkaligenes ammoniagenes*), or certain strains of Proteus, which originate from the feces of infants.

Benson found that Diaparene® Chloride would inhibit the growth of *B. ammoniagenes* in agar-plate tests in concentrations as low as 1:110,000. The germicide was also found to have a definite antibacterial action on the bacterium in the presence of broth in dilutions up to and including 1:200,000. Diapers treated with a 1:10,000 solution of the Quat and inoculated with *B. ammoniagenes* and urine were found to have but a faint trace of ammonia odor after 24 hours. The untreated fabrics, on the other hand, had a strong ammoniacal odor upon storage of 15 to 20 hours. Clinical studies on the Quat revealed that concentrations of 1:5,000 could readily be tolerated by infant and newborn when the solution was applied to the skin in the form of wet-patch tests for 24 hours. The recommended concentration for general use in rinsing diapers in the home was 1:25,000 of the Quat. Two quarts of this solution would effectively treat six diapers. In the first publication of Benson and his group[26], mention is made that by the impregnation of diapers with the Quat germicide, 49 infants with ammonia dermatitis were cleared of the condition within one week. A subsequent report[27] described 500 cases of diaper rash in which 436 cleared up within one week upon treatment of diapers with Diaparene® Chloride solution. Of the 64 failures, 9 refused further treatment, 23 were thought to have some other type of dermatitis, in 11 the mothers had not followed instructions, and in 21 no reason could be found of failure.

Brooke[28] preferred the use of a water-repellent cream containing Diaparene® Chloride and casein as a competitive substrate for fecal proteolytic enzymes, rather than the application of boric acid dusting powders or ointments for the skin care of the diaper areas of infants. He also recommended that the Quat be used for rinsing diapers to prevent or cure ammonia dermatitis in infants. The preference for a Quat preparation by Brooke was the result of various reports in the literature on the serious or fatal poisoning from applications of boric acid to macerated or excoriated skin.[29,30,31]

Niedelman and Bleier[32,33] reviewed the results of their practice in the use of a water-miscible ointment containing Diaparene® Chloride. In one of these publications, involving a series of 107 cases of ammonia dermatitis, only eight were unimproved, three of whom had an accompanying infantile eczemoid dermatitis. Excellent results were obtained in the remaining individuals following treatment from one day to three weeks.

In addition to the incorporation of a Quat in an ointment base to be applied in the prevention and cure of ammonia dermatitis in infants, the germicides have been mixed with dusting powders such as talc*[34] and with starch[35] and applied to the areas exhibiting the rash.

Comparing the therapeutic value of Diaparene® Chloride Powder (corn starch and sodium bicarbonate base) with Diaparene® Chloride water-miscible ointment, Lipschutz and Fischer[36] reported the powder proved 80 percent effective and the ointment 85 percent when each was used alone. When application was combined with this same Quat as a diaper rinse, the efficacy proved 100 percent. They further reported that 5 percent borated talcs have no practical antiseptic effects.

References to the use of Quats for various dermatologic conditions, other than ammonia dermatitis, may be found in a review of Lawrence[37].

Sanitizing Agents in Laundering

While on the subject of certain pertinent points that must be taken under consideration on the use of Quats as sanitizing agents in the routine of laundering, it might be well to mention the report of Ridenour and Associates[38] of the National Sanitation Foundation on this subject. The latter publication includes a comprehensive study on the relative efficiencies of automatic clothes washing machines. The investigation involved a combination of radiological and bacteriological sampling techniques which, in the opinion of Ridenour and his group, permitted a very accurate estimation of the bacteriological efficiencies of a number of experimental processes that were included in the machine washing operation. To mention some of the points of significance to the present text, we note the following from the summary of the latter publication: (1) Use of a soap detergent alone in the complete laundering operation will result in the removal from a low percent to 99.0 percent of the bacteria in the cloth; (2) the latter range of removal of organisms

* Personal communication

is dependent upon (a) the presence or absence of soil, (b) the amount of detergent, and (c) the type of automatic washer used; (3) by the use of chemicals as sanitizing agents (5 to 10 parts per million "ppm" of residual chlorine, 100 ppm of chloramine, or 50 to 100 ppm of certain Quats in the final rinse would result in a 99.0 percent reduction of bacteria in addition to that removed by the detergent wash cycle and rinse cycle); (4) certain Quats will leave a residual in the fabrics which is advantageous in that the latter imparts a definite bacteriostatic action to the fabric and is not removed by rinsing in cold, warm, or boiling water; and (5) while bacterial spores are practically impossible to be destroyed by heat or chemicals in the practical laundering process, the Quats have a definite bacteriostatic effect against spore vegetation.

Smigel[39] has indicated that skin irritation, excoriations and ulcerations are symptoms that commonly occur in the aged incontinent. In lieu of the poor results that he obtained with most forms of ointments, powders etc., in the deeper seated vesicular ulcerations and excoriations, attention was directed to the use of Diaparene® Chloride in the final rinse of linens accompanied with the dusting of Diaparene® Chloride Powder on the linens or application of Diaparene® Chloride Ointment on the skin of the patients. In all but 2 of 57 cases, the urinary skin lesions were either improved or completely healed by one or more of the above forms of treatment. Note was also made that there was a definite control of the offensive odors usually encountered among incontinent patients.

Grossman[40] advocated the use of Diaparene® Chloride in the final rinse of diapers for controlling ammonia dermatitis.

Contact Dermatitis

"Contact dermatitis" is a term applied to rashes caused by contact of the diaper area of the skin with vegetable and mineral irritants often found in soaps or lotions that are applied to the skin, by certain chemicals used in washing, or by the soaps and bleaches that are used in washing the diapers. Of particular importance was the note by Grossman that "Home automatic washers often fail in completely removing detergent residue from laundered diapers. A diaper service which employs a 'non-detergent' wash formula, preferably with an antiseptic rinse, such as Diaparene® Chloride, may prevent this type of contact dermatitis."

Choice of Laundering Methods

It may be well to mention at this point, two additional and recent publications on the subject of home washing equipment *versus* hospital laundering or professional service laundering of diapers. Watson, Wilson and Tuuri[41] advocated the use of home washing units in a utility area adjoining hospital nurseries for the laundering of diapers. This recommendation was based on their observations that sterility resulted about 80 percent of the time by the use of home washing equipment, and of particular importance, was the saving in time of nursing and auxiliary personnel with regard to handling and inventory keeping of the diapers used in the nursery unit. Sherrill and Kinard,[42] on the other hand, questioned the recommendations of Watson and his co-workers of the use of home washing equipment for washing diapers in hospital nurseries by citing several factors which favored the routine hospital laundry and commercial service laundries. In carefully controlled bacteriological studies in diaper washing procedures, Sherrill and Kinard,[42] and Oesterling[43] found that the regular or routine commercial washing methods, which employ an adequate amount of hot water (160°F. and 180° F.), properly blended soap and alkali, chlorine bleach and a sterilizing sour, would result in a reduction of total bacterial count of nearly 99.9 percent. In contrast to the latter, reduction in counts of only 91.4 percent could be attained in diapers processed in home-washing equipment.

Prevention of Perianal Dermatitis

A description of a formula has been provided by Grossman[40] for the local application of an antibacterial water-repellent and cod liver oil cream with casein competitive substrate (Diaparene® Peri-Anal) for the prevention and treatment of perianal dermatitis. With respect to ammonia dermatitis, Grossman indicated that "methylbenzethonium chloride (Diaparene® Chloride) has proven effective in preventing this condition and has replaced the use of mercurials and boric acid, which are potentially poisonous.[44,45]"

Ancona and Maffia[46] listed the several types of dermatitis that commonly occur in the incontinent aged: (1) ammonia dermatitis; (2) perianal dermatitis (fecal dermatitis); (3) decubitis ulcers; and (4) intertrigo. In the prevention and treatment of all these conditions they point out that attempts should be made to diagnose and treat correctly the major disease present, improve the circulation and strive for maximum nutrition. In additon to these factors, they recommended that the general hygienic measures to be followed should include: (1) frequent bathing; (2) change of bed positions; (3) gentle

massage; (4) alcohol rubdowns; and (5) powdering and changing of linens. In controlling ammonia dermatitis, Ancona and Maffia advocated the use of a 1:10,000 solution of Diaparene® Chloride in the final rinse of all bed linens and underclothing, and also use of the germicide in a dusting powder, or in the form of an ointment as adjuncts to the rinse. They too pointed out that with this regime, the odor of ammonia will virtually disappear in 24 hours and with the lessening of ammonia formation, improvement in the skin lesions could be expected within a few days.

Prophylaxis of Urinary Excoriation

Further references to clinical studies on the use of Diaparene® Chloride for the prophylaxis and treatment of urinary excoriation and similar conditions in incontinent neurologic and urologic patients may be found in the publications of Barwise and Caron[47], Silverstein and Gips[48,49], and Nagamatsu, Johnson and Silverstein[50]. Some of these reports recommend that Diaparene® Chloride be impregnated into dressings, towels and diapers, and also incorporated into powders or water-miscible ointments and used as adjuncts where ulceration had occurred.

Deodorizing Properties of Quats

With reference to the deodorizing properties of Quats, brief notes by Vogel[51], Brown[52] and Rodman[53] indicate that this group of compounds are not only effective in eradicating the offensive odors from chronic indolent ulcers which are secondarily infected, decubitus ulcers, in gangrenous lesions, and in advanced cases of carcinomatous ulcerations, but will also banish the odors associated with the "untidy patients' rooms in mental institutions and in the toilets of general hospitals[52].

Unsolved Problems

A concluding note on this subject would propose the desirability of obtaining information on the effects of "sours" and "softening", or "sizing" agents upon the sanitizing effects of Quats that are used in the final rinses in commercial general and diaper laundry services. Detailed investigations are also lacking on the use of chemical agents in hospital launderies as a protective measure for the laundry workers who are subject to exposure of soiled bedding and linens from patients in contagious disease wards of hospitals. Finally, a problem of public health significance would include an investigation for preventing recontamination of washed bedding in the laundry by incorporation of a suitable "sanitizer" in the final rinse and also by a "re-evaluation of laundry procedures, construction and ventilation control[21]".

Conclusion

After a review of the literature, the impregnation of fabrics with appropriate chemical agents seems to afford medicine another means of preventing and treating disease. This is especially true for skin diseases such as furunculosis, ammonia dermatitis, and other diaper dermatoses. Evidence also seems to indicate that respiratory diseases and streptococcal infections can be decreased by impregnation of blankets and soiled clothing. Further investigation in this field certainly seems warranted.

The quaternary compounds (Quats) apparently have been the most successfully used antiseptics in fabric impregnation for the following reasons: (1) with proper care they are non-irritating, non-allergic, non-toxic and are adequate antibacterial agents; (2) they tend to remain in the fabric despite many washings.

Summary

A review of the literature on the antiseptic impregnation of contaminated fabrics (sick-room, diapers, etc.) is presented.

Quaternary compounds, e.g., Diaparene® Chloride, Roccal,® etc., are excellent for this purpose and their use in power laundries has been demonstrated. They have wide clinical application in the prevention and treatment of ammonia dermatitis.

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FIG. 5. *Some examples of modern labeling*

by R. LEWIS RIEGER *and* MILTON W. SKOLAUT

THE PROBLEM OF SATISFACTORY LABELING has accompanied the hospital pharmacist throughout his evolution. Numerous forward steps have been made since the days when labels were etched on glass containers, porcelain labels were cemented to bottles, and the mucilage pot with paper, as well as the ancient ceramic herb jars, were commonly used. Following the constant trend toward standardization of labels, the practicing hospital pharmacist developed the hospital legend, which appeared on all labels, and finally the pre-printed label with generic nomenclature. Today, we have access to the off-set printing press.

Labels By Off-set

Figure 1 shows an off-set printing press along with its operator and a few labeled containers. Fundamentally, the machine pictured here is simple in operation. Brass type is set in the upper portion of the press, the operator depresses the clutch pedal and the upper portion containing the type moves down onto a gelatin transfer pad. Figure 2 shows the operator preparing to depress the clutch pedal. Figure 3 shows the upper portion of the machine lowered onto the gelatin transfer pad; note the operator's foot depressing the clutch pedal. During the press's movement down onto the pad, a gelatin roller passes over the type and applies a coating of ink. The above description outlines the mechanical function of the machine.

Printing on Containers

Now let us look at the process of transferring the printing from the gelatin transfer pad onto the containers. Transferring the printing onto the containers entails passing the individual bottle, tube or jar over the gelatin transfer pad upon which a sequence of printed letters appear as a result of the above mechanical operation. Again, look at Figure 1 where you can see the operator beginning to pass the glass container over the transfer pad. In Figure 4, the operator was photographed immediately after passing the container over the pad; note the printed surface on the bottle in this photograph. In order to obtain a better idea of the overall pro-

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cess, following is the procedure utilized by our hospital pharmacy, which operates an off-set printing press.

I. Planning Of Label By Pharmacist
   A. Selects size of type
   B. Selects style of type
   C. Selects color of ink
   D. Selects variety of containers
   E. Determines quantity of units
II. Acquisition Of Containers By Helper
   A. Removes from shipping cartons
   B. Removes caps from containers
III. Setting Of Type By Operator
   A. Follows pattern set by pharmacist
IV. Checking Type By Pharmacist
   A. Checks type set
   B. Checks color of ink
   C. Checks containers
V. Labeling Process By Operator
   A. Transfers type to containers
VI. Air Drying Or Baking
   A. Polyethylene—air dry only
   B. Glass suitable for re-use
      1. Baked for one hour
      2. May be labeled after filling
VII. Replacing Of Caps By Operator
VIII. Dismantling And Cleaning Type By Operator
      1. Ethyl acetate solvent used
      2. Removes ink from type
      3. Removes ink from ink-disc
      4. Removes ink from roller

Examples

After discussing the above process, it is only fitting to examine some of the labeled containers produced by the machine and operator in our hospital pharmacy. Figure 5 shows a display of a variety of type sizes, type styles and containers. The off-set printer's versatility is shown in this picture. The selection of the type style and size is a responsibility of the pharmacist. As you can notice in the photo on page 171, the name of the product is printed in the largest and boldest type. Each subordinate component part of information is printed in a smaller and less bold form of type. This method of selecting style and size of type tends to emphasize the actual name of the product, which is indeed the paramount purpose of a label.

The operator pictured above is classified as a pharmacy helper. She has been working with the off-set printer for about one year. As a result of her experience with the machine, she now produces about fifteen units per minute on an average type container. The time required to set up and ink the machine ranges from ten to fifteen minutes, varying according to the amount of information contained on the label.

Advantages and Disadvantages

Rather than going into great detail in elaborating on some of the advantages and disadvantages of the off-set printer, a compiled list is shown below.

ADVANTAGES

1. Permanence and stability of labels
2. Labels are immediately available
3. Flexibility and versatility; *i.e.*, colors, size, surfaces, containers
4. No protective coating needed
5. More readable
6. No great storage space is required as with pre-printed labels
7. Application is speedy—15 minutes
8. Reduction of error-source common to individually typed labels
9. Professional or aesthetic appearance
10. Lower long-term cost
11. Low operating costs
12. Difficulty of duplication of labels by other departments in the hospital
13. Label is transparent
14. Control numbers may be incorporated into label with ease

DISADVANTAGES

1. High initial investment
2. Training operator
3. Source of supply is somewhat limited
4. Once bottle is printed other use is impossible, if baked
5. Minimum units for operation is high—about two or three dozen
6. Large bottles cannot be labeled; *i.e.*, gallons
7. Machine may be dangerous to untrained operator
8. Bottles, glass, must be baked for re-use

The initial high investment is the main disadvantage in possessing an off-set printer. Some of the advantages may help convince a hospital administrator or a pharmacy chief that this disadvantage is not as bad as it may seem. First, consider the amount of storage space needed for pre-printed labels and blank paper labels. Second, think about the time required to place paper labels on bottles and protective coat them. Third, consider the long term durability of the machine and low operating cost. Brass type is permanent and does not require replacement. Other items such as gelatin pads and ink needed for operation are relatively inexpensive. Fourth, consider the flexibility and versatility of the machine, noting its different printing styles, sizes and other uses such as labeling small pieces of equipment or clothing such as uniforms.

Experience has shown that the advantages far off-set some of the disadvantages during a long term use.

FIG. 1. *The operator at the offset printing press*

FIG. 2. *The operator prepares to depress the clutch pedal.*

FIG. 3. *The upper portion of the machine is lowered onto the gelatin transfer pad.*

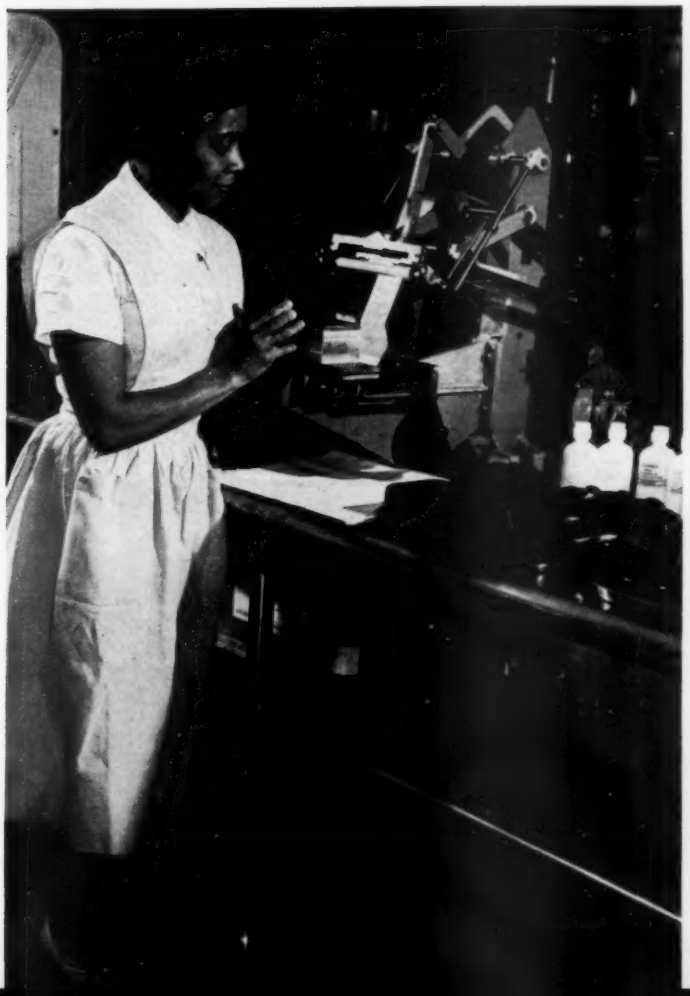


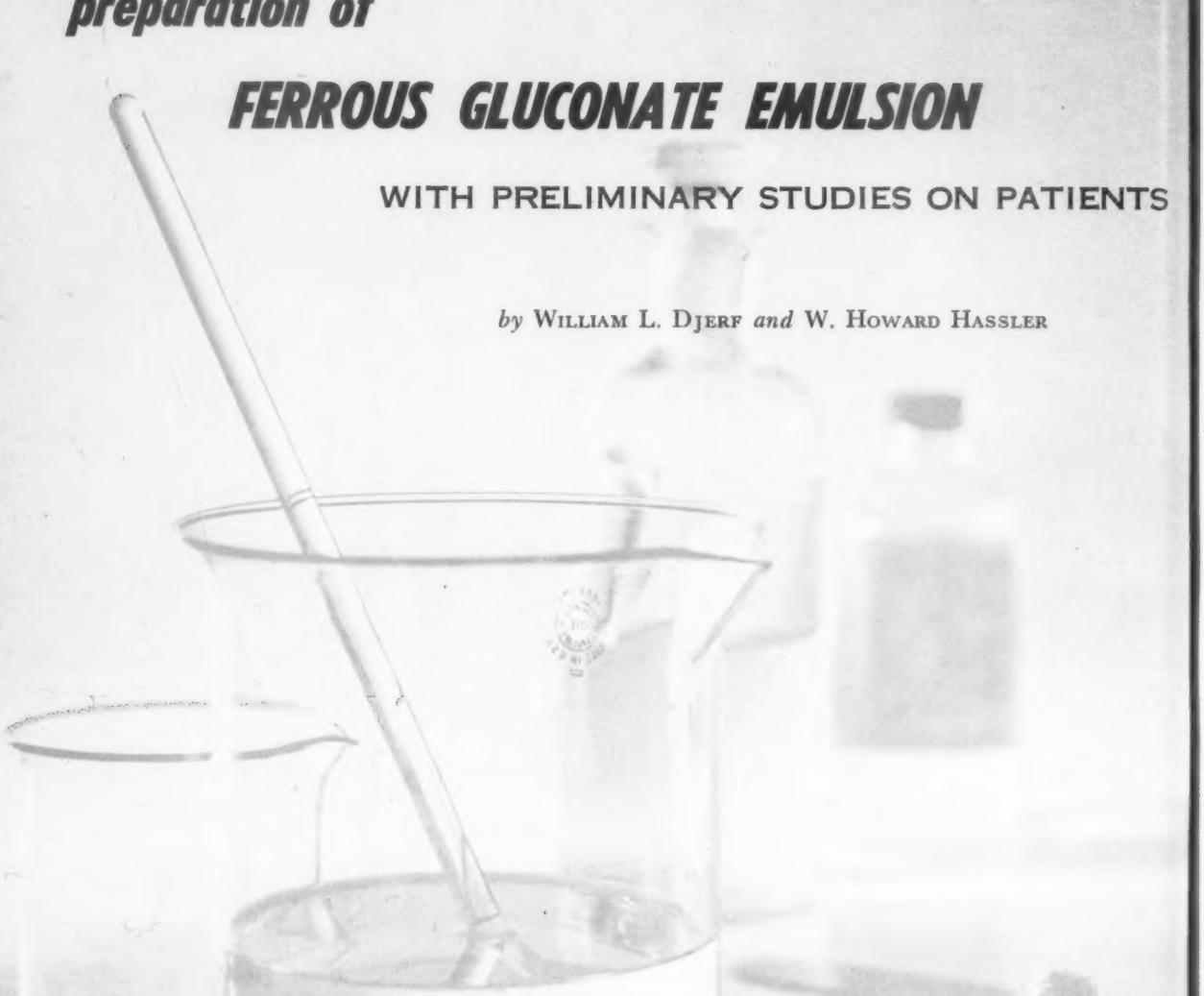
FIG. 4. *The container has been passed over the pad and the label is noted.*

preparation of

FERROUS GLUCONATE EMULSION

WITH PRELIMINARY STUDIES ON PATIENTS

by WILLIAM L. DJERF *and* W. HOWARD HASSLER



IN THE SEVENTEENTH CENTURY Sydenham introduced iron into clinical medicine for the treatment of anemia. Iron salts had been employed by physicians for other purposes since the time of Hippocrates. The only important use of iron in modern medicine is in the treatment of iron deficiency anemias. The administration of iron to patients with normal blood values serves only to increase the "reserve iron" of the body, and not to increase the red blood cells or hemoglobin above their normal physiological limits.

Conventional doses of iron salts used in anemias may cause gastrointestinal reactions characterized by gastric distress, colicky pain, and diarrhea.[1] These complaints are more prominent with the use of the ferric than of the ferrous salts. It may require several days to properly adjust the dose of iron in order to prevent gastrointestinal symptoms; the full dose should not be given at the onset. If distress is experienced, the iron should be omitted for a day or two; then smaller doses should be given and gradually increased to the limit of gastrointestinal tolerance. The ferrous salts, especially the sulfate and the gluconate, are considerably less irritating to the intestinal tract, at least in part because smaller doses are required. Diarrhea may occur in some patients with sensitive alimentary tracts, but a slight degree of constipation is perhaps more common.

The choice of preparation also largely depends on the hematopoietic response of the patient. Theoretically, almost any iron preparation given in sufficient amount should be effective

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in iron deficiency anemias. In clinical practice, however, it may be impossible to give an adequate dose of a particular preparation because of the side actions mentioned. A few cases may be found refractory to any form of oral iron therapy. Patients who are apparently refractory occasionally respond satisfactorily when the dose of iron is increased or the preparation is changed. There is no evidence of tolerance to iron even after long continued use.

Since iron is absorbed only when in the bivalent form, the ferrous salts are therapeutically most effective in terms of their content of elemental iron. Nevertheless, soluble ferric salts, and even the uncombined metal itself in the form of Reduced Iron N.F. yield, as the result of chemical action by the gastric and intestinal secretions, sufficient ferrous ions to be effective therapeutically when administered in doses which are relatively large in terms of iron contents.[2]

Although many preparations of iron have been employed in the treatment of anemia, a relatively small number have special merit from the standpoint of effectiveness, tolerance, and convenience of administration.

Objectives

In many patients the administration of iron salts for the treatment of iron deficiency anemias gives rise to symptoms of gastric distress, nausea, and vomiting.[3] This gastric distress brings about the consequent risk of self-discontinuation of treatment by the patient.[3]

In order to lessen the gastric irritation of the iron salts, the use of a new type preparation was investigated. Heretofore, capsules, tablets, pills, aqueous solutions, syrups, and elixirs of the iron salts have been employed in iron deficiency anemia with varying degrees of success. However, up to this time no completely satisfactory preparation has been formulated. It was decided to prepare an iron emulsion with the hope that the oil phase would protect the gastric mucosa from the irritating effect of the iron salt.

The iron salt selected was ferrous gluconate, because it was found to be the most stable in an emulsion. It was decided to compare the emulsion against tablets of the same salt to determine the relative degree of irritation produced by the two different basic preparations.

Experimental Formulation

A search of the literature reveals no mention of an iron salt in the form of an emulsion. Since ferrous sulfate is the most commonly used iron salt this was the first one chosen to be incorporated into an emulsion. We were unable to prepare a satisfactory emulsion of ferrous sulfate. Since ferrous gluconate is the next most commonly used iron salt this was the next one investigated. Eleven formulations were made before an emulsion was produced, which was considered satisfactory.

General Procedure For Manufacture

To prepare 1,000 ml. of ferrous gluconate emulsion according to the following formula:

Ferrous Gluconate Emulsion	
Cottonseed Oil	500
Ferrous Gluconate	60
Span 80	70
Tween 60	30
Saccharin Sodium	2
Methylparaben	0.5
Propylparaben	0.1
Water, to make	1000 ml.

First place the cottonseed oil with the Span 80, Tween 60, methylparaben and propylparaben in an Eppenbach Colloid Mill. Dissolve the saccharin sodium in the water, then stir the ferrous gluconate powder into the water. Do not use heat to facilitate solution since it causes the product to darken. With the mill running, add the water to the oil phase.

The finished product should be placed in well filled dark containers to retard the decomposition of the ferrous gluconate.

Stability of Ferrous Gluconate Emulsion

If air is allowed to come in contact with the emulsion, decomposition occurs as evidenced by a brown color being formed at the surface of the emulsion. The product when stored in full containers for six months showed no evidence of color formation. In a partly filled container the color is evident at the end of a 24-hour period. Once the container is opened it can be stored under refrigeration without decomposition occurring for a period of 6 months.

With well filled containers there was no evidence of the oil becoming rancid at the end of a six month period as evidenced by taste and color.

Irritation Studies

In order to evaluate the irritating effect of ferrous gluconate emulsion, 50 patients were first given ferrous gluconate tablets (0.15 Gm.). A dose of two tablets three times a day was given for a 48 hour period. Patients who showed no complications, as evidenced by nausea, cramping, diarrhea, or constipation, were eliminated

from the study because we felt that these individuals did not have a sensitivity to ferrous gluconate preparations. If the patients showed any of the above symptoms they were recorded and the patient was chosen for the ferrous gluconate study.

From 50 patients, 12 complained of definite symptoms as shown in the following table.

TABLE I

IRRITATION FROM FERROUS GLUCONATE TABLETS

PATIENT	NAUSEA	CRAMPING	DIARRHEA	CONSTIPATION
1				X
2		XX		
3				X
4	XX			
5				X
6	X			
7			X	
8		X		
9	X			
10				XX
11				XX
12	X	XX		

At the end of ten days following discontinuance of therapy with the tablets all of the 12 patients had no gastric symptoms.

The patients were then given one teaspoonful of the ferrous gluconate emulsion in fruit juice three times a day for two days, this daily dose corresponding to the amount of ferrous gluconate in the daily dose of tablets. Response from the ferrous gluconate emulsion on these 12 patients was evidenced by gastric symptoms as shown in Table II.

TABLE II

IRRITATION FROM FERROUS GLUCONATE EMULSION

PATIENT	NAUSEA	CRAMPING	DIARRHEA	CONSTIPATION
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				X
11				X
12		X		

Hemoglobin Response in Patients Taking the Emulsion

Hemoglobin determinations were done on the 12 patients found to be sensitive to ferrous gluconate therapy.* From the 12 patients, three were found to have a deficient hemoglobin level, as shown in Table III.

TABLE III. SUBNORMAL HEMOGLOBIN LEVELS IN CLINICAL PATIENTS

PATIENT	HEMOGLOBIN LEVEL
A	7.5
B	9.0
C	8.5

*Haden-Hausser Method

The three patients who had a low hemoglobin level were given ferrous gluconate emulsion, one teaspoonful three times a day for ten days. At the end of this period hemoglobin levels were again determined. The response to this therapy is shown in Table IV.

TABLE IV

HEMOGLOBIN LEVELS IN CLINICAL PATIENTS FOLLOWING FERROUS GLUCONATE EMULSION

PATIENT	HEMOGLOBIN LEVEL BEFORE FERROUS GLUCONATE THERAPY	HEMOGLOBIN LEVEL AFTER FERROUS GLUCONATE THERAPY
A	7.5	11.5
B	9.0	14.5
C	8.5	13.0

Therefore, in hypochromic microcytic anemia ferrous gluconate emulsion gives a therapeutic response indicating that the iron is absorbed in the emulsion form.

Summary and Conclusions

1. A ferrous gluconate emulsion has been formulated.

2. The procedure for compounding a ferrous gluconate emulsion is outlined.

3. The ferrous gluconate emulsion is stable under the conditions outlined.

4. Clinical trial has shown that the emulsion was better tolerated than tablets of the same drug.

5. Preliminary study indicates the emulsion to be an effective form of therapy.

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study of stability of

sulfadiazine injection

II. preparation and stabilization of sulfadiazine sodium injection

by F. S. Hom *and* J. Autian

In a previous publication[1] a review of literature disclosed very little information concerning the stability of sulfadiazine sodium solutions. The two chief complaints concerning Sulfadiazine Sodium Injections received by the Armed Services Medical Procurement Agency from the Services Hospitals throughout the United States were a development of a color and a precipitation on long standing. In the first part of this study[1], it was hoped that the determination of solubility of sulfadiazine sodium as a function of *p*H in several parenteral solvent systems could produce a solvent which would enhance the solubility of sulfadiazine at lower *p*H values. It was assumed that the lower *p*H would retard the development of color without producing the usual precipitation of the insoluble sulfadiazine. The results

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Abstract

Various solutions of sulfadiazine sodium were formulated containing water or a mixture of water and polyethylene glycols as solvents. Sodium sulfite, sodium formaldehyde sulfoxylate, and sodium thiosulfate were incorporated into a number of the formulas as antioxidants. The solutions were placed in ampuls and sealed either in the presence of air or in a nitrogen atmosphere. The injections were stored under the following conditions: (1) at 5° C., (2) at room temperature in the dark, (3) at room temperature exposed to direct rays of sun, (4) in presence of artificial light, and (5) at 60° C. At the end of the study the injections were evaluated for coloration and precipitation. From the results of the investigation a proposed formula and a method of preparation were derived.

indicated that the polyethylene glycols had the greatest solubilizing effect but this could not be considered outstanding when compared to water.

The objective of the second phase of this study was to study the stability of sulfadiazine sodium injections in order to recommend a formula and a method of preparation.

Experimental

Supplies and Apparatus

Sulfadiazine Sodium, U.S.P.; Polyethylene Glycol (PEG) 200 and 400, Carbide & Carbon Chem. Co., New York, New York; Sodium Sulfite, Exsiccated, U.S.P.; Sodium Thiosulfate, N. F.; Sodium Formaldehyde Sulfoxylate, Rohm & Haas Co., Philadelphia, Pa.; Ampuls, Clear Glass Type I, 20 ml., (Tuf-Top, Neutraglass) Kimble Glass Co., Toledo, Ohio; Dry Nitrogen Gas, Airco Co., Philadelphia, Pa.; Beckman *p*H Meter, Model G; Beckman DU Spectrophotometer; Vacuum filtration apparatus with a fused-in Gooch crucible; Fritted disc filter of medium porosity; Constant temperature ovens.

Stability Study of Various Formulas

Various formulas of sulfadiazine sodium injection were prepared in the following manner:

The water utilized in these experiments was distilled water redistilled in an all-glass apparatus. The containers, ampuls, and Berkefeld filters were washed, rinsed, or flushed with distilled water, followed by glass-distilled water. The calculated quantities of sulfadiazine sodium (25 percent w/v) and antioxidant were dissolved in water and then, if necessary, the polyethylene glycol was added to give the desired concentration of the solvent. Enough water was then added to bring the volume up to 250 ml. in a volumetric flask. This solution was filtered through a Berkefeld filter under reduced pressure. It was found necessary to apply heat from a water-bath to the preparation containing 50 percent w/v sulfadiazine sodium in order to hasten its solution. Two ml. samples from each formula were withdrawn and assayed.[2]

Five ml. portions of the above solutions were placed in 20 ml. ampuls with the aid of a syringe and a long, narrow glass tube. Care was taken not to permit any of the solution to touch the neck of the ampul. Thirty-two ampuls of each respective formula were prepared, sixteen of them were sealed in the presence of air while the remaining sixteen were sealed in the presence of nitrogen.

Nitrogen gas from the cylinder was bubbled through distilled water in a suction flask. From the flask, the gas was passed through a glass tube, which was placed 5 mm. above the solution, into the ampul for a period of thirty seconds. The tube was withdrawn and a rubber pull-over cap was placed over the open end of the ampul. The ampul was then quickly sealed.

Four ampuls from each batch were stored at the following conditions:

1. At 5° C.
2. At room temperature (about 25° C.) in the dark.
3. At room temperature (about 25° C.) exposed to direct rays of sun.
4. At 60° C.

The data summarizing the color change and precipitation of sulfadiazine sodium solutions after thirty weeks of storage is presented in Table I. Table II includes stability after 20 weeks. The criteria for establishing whether an injection was stable or not was determined by considering

TABLE I. COLOR CHANGE AND PRECIPITATION OF SULFADIAZINE SODIUM STORED AT VARIOUS CONDITIONS FOR 30 WEEKS. COLOR CHANGE EXPRESSED AS PERCENT TRANSMITTANCY AT 500 mu.

FORMULA*		5°C	25°C IN DARK	25°C IN LIGHT	60°C
S. S. 25%	(A)	96 V.L.**	92 L	0 L	8 N
S. S. 25%	(N)	100 V.L.	93 V.L.	10 L	28 L
S. S. 25%;PEG 200 30%	(A)	94 X	87 X	0 L	1 L
S. S. 25%;PEG 200 30%	(N)	100 X	89 X	36 X	57 V.L.
S. S. 25%;PEG 400 30%	(A)	94 X	85 X	0 L	0 L
S. S. 25%;PEG 400 30%	(N)	100 X	86 X	24 X	60 X
S. S. 25%;Sodium Sulfite 0.1%	(A)	69 V.L.	63 L	0 M	0 M
S. S. 25%;Sodium Sulfite 0.1%	(N)	80 V.L.	70 V.L.	68 V.L.	90 X
S. S. 25%;PEG 200 30%;Sodium Sulfite 0.1%	(A)	79 X	80 X	0 L	1 L
S. S. 25%;PEG 200 30%;Sodium Sulfite 0.1%	(N)	94 X	87 X	79 X	97 X
S. S. 25%;PEG 400 30%;Sodium Sulfite 0.1%	(A)	77 X	81 X	0 M	0 M
S. S. 25%;PEG 400 30%;Sodium Sulfite 0.1%	(N)	100 X	96 X	97 X	98 X
S. S. 25%;Sodium Sulfite 0.5%	(A)	49 L	74 L	0 M	0 M
S. S. 25%;Sodium Sulfite 0.5%	(N)	100 V.L.	100 X	95 X	100 X
S. S. 25%;PEG 200 10%;Sodium Sulfite 0.5%	(A)	61 X	64 X	0 M	1 L
S. S. 25%;PEG 200 10%;Sodium Sulfite 0.5%	(N)	100 X	100 X	100 X	100 X
S. S. 50%	(A)	92 X	73 X	0 X	0 L
S. S. 50%	(N)	100 X	83 X	0 X	59 X
S. S. 50%;PEG 200 10%	(A)	90 X	82 X	0 X	0 L
S. S. 50%;PEG 200 10%	(N)	100 X	88 X	19 X	68 X
S. S. 50%; Sodium Sulfite 0.1%	(A)	75 X	74 X	0 L	0 M
S. S. 50%; Sodium Sulfite 0.1%	(N)	100 X	96 X	94 X	94 X
S. S. 50%;PEG 200 5%;Sodium Sulfite 0.1%	(A)	73 X	73 X	0 L	0 X
S. S. 50%;PEG 200 5%;Sodium Sulfite 0.1%	(N)	100 X	96 X	94 X	99 X
S. S. 50%; Sodium Sulfite 0.5%	(A)	55 X	65 X	0 L	0 L
S. S. 50%; Sodium Sulfite 0.5%	(N)	100 X	98 X	90 X	99 X

*S. S.—Sulfadiazine Sodium
(A)—Ampuls sealed in Air
(N)—Ampuls Sealed in Nitrogen
PEG—Polyethylene Glycol

**Precipitates expressed as:
X—no ppt. V.L.—Very light ppt.
L—Light ppt. M.—Medium ppt.
H—Heavy ppt.

(1) the development and intensity of color and (2) the presence and degree of precipitation.

Since the color of these injections changed progressively from clear water-white to light yellow, to yellow, to orange-red and finally to a very dark brownish-red, it was decided to measure the percent transmittancy utilizing the Beckman Spectrophotometer at 500 *mu*. In each case the standard used was a freshly prepared solution containing the same formula as the injection studied. The results of the observation of these solutions at the end of the storage period were arbitrarily classified into five categories: no precipitate, very light precipitate, light precipitate, medium precipitate and heavy precipitate.

Storage in Presence of Artificial Light

A number of injections were prepared as above and were placed under the direct rays of two 200 watt bulbs for two weeks. The bulbs were approximately eighteen inches from the top of the ampuls. These results are reported in Table III.

Assay of Injections

Preliminary assay procedures by the U.S.P. method[2] indicated that decomposition of sulfadiazine sodium was less than 1 percent when various samples were stored for four weeks at 60°C. A number of these injections (not prepared in a nitrogen atmosphere) had turned to a brownish-red solution. These injections, also, showed less than 1 percent decomposition by the U.S.P. method.

Discussion

The stability study in these experiments was conducted in a qualitative manner rather than the more rigorous quantitative method. The use of the term "stability" in this paper refers to the

(1) absence of color and (2) absence of a precipitate. It was felt that this qualitative approach to the study would best serve the purpose of the problem, since the object of the research was to select a formula and a method of preparation which would insure maximum stability at various conditions. Unfortunately, certain aspects of the problem could not be too clearly elucidated. Such factors as *p*H, ionic strength, anomalous behavior with antioxidants could not be answered in their entirety at this time. The results of the study did, however, achieve the prescribed objective.

Examining the data, Tables I, II and III, it was concluded that the most stable sodium sulfadiazine injections contained an antioxidant, and polyethylene glycol, prepared in a nitrogen atmosphere. Those injections containing sodium sulfite or sodium formaldehyde sulfoxylate prepared in nitrogen atmosphere were considered quite stable. From a critical evaluation of the data, it was quite apparent that oxygen was the chief factor for the deterioration of sulfadiazine sodium injection. The catalytic effect of light also was shown dramatically in these studies.

An interesting observation of the data indicated a rather anomalous behavior of the antioxidant in protecting the sulfadiazine sodium from oxidation. In nearly every instance, the injections with antioxidants, when prepared in the air, gave more color change than the injections without an antioxidant. This same phenomenon was reversed, however, when the injections were prepared in a nitrogen atmosphere.

In the second instance, the injection with the antioxidant proved to be the most satisfactory formulation while those without the antioxidant produced the coloration. Even though this behavior is seemingly quite unexplainable, a further examination of the experiments and method of preparation gave enough information to postulate a reason for this odd behavior. The results indicated that in the presence of air, on long standing, the antioxidant itself became oxidized and no longer could protect the sulfadiazine sodium. Since there was still enough oxygen in the ampuls, oxidation of the sulfadiazine was accelerated, apparently being catalyzed by the antioxidant or its decomposition product. In the ampuls containing no antioxidant and nitrogen, there apparently was enough residual oxygen to oxidize the sulfadiazine and to impart the coloration. In this system the micro-quantities of oxygen could be reduced by the presence of an antioxidant, so that the oxidation of the sulfadiazine would be prevented.

The mechanism of oxidation is usually quite complex. It should suffice at this time to interpret the results in this study as indicating that oxygen is necessary for the deterioration of the sulfadiazine. If the data has been evaluated correctly, one must rule out the phenonemon of autoxidation. Once again, if this assump-

TABLE II. COLOR CHANGE AND PRECIPITATION OF SULFADIAZINE SODIUM STORED AT VARIOUS CONDITIONS FOR 20 WEEKS. COLOR CHANGE EXPRESSED AS PERCENT TRANSMITTANCY AT 500 mu.

FORMULA*		5°C	25°C IN DARK	25°C IN LIGHT	60°C
S. S. 25%; Sod. Form. Sulf. 0.1%	(A)	95 L	95 L	0 M	19 H
S. S. 25%; Sod. Form. Sulf. 0.1%	(N)	100 X	100 X	100 X	100 X
S. S. 25%; PEG 200 10%; Sod. Form. Sulf. 0.1%	(A)	95 L	89 L	0 M	10 H
S. S. 25%; PEG 200 10%; Sod. Form. Sulf. 0.1%	(N)	100 X	100 X	100 X	100 V.L.
S. S. 25%; Sod. Form. Sulf. 0.5%	(A)	93 H	89 H	0 H	43 H
S. S. 25%; Sod. Form. Sulf. 0.5%	(N)	100 X	100 X	100 X	100 X
Form. Sulf. 0.5%	(A)	96 H	92 H	35 H	37 H
S. S. 25%; PEG 200 10%; Sod. Form. Sulf. 0.5%	(N)	94 L	100 V.L.	100 V.L.	100 X
S. S. 50%; Sod. Form. Sulf. 0.1%	(A)	94 L	89 L	0 M	33 H
S. S. 50%; Sod. Form. Sulf. 0.1%	(N)	100 X	100 X	100 X	99 X
S. S. 50%; Sod. Form. Sulf. 0.5%	(A)	97 M	90 H	22 H	24 H
S. S. 50%; Sod. Form. Sulf. 0.5%	(N)	100 X	100 X	100 X	100 X
S. S. 25%; Sodium Thiosulfate 0.5%	(A)	97 V.L.	97 V.L.	0 H	19 H
S. S. 25%; Sodium Thiosulfate 0.5%	(N)	100 V.L.	98 V.L.	93 V.L.	95 X
S. S. 25%; PEG 200 10%; Sodium Sulfite 0.5%	(A)	86 V.L.	64 V.L.	0 L	21 H
S. S. 25%; PEG 200 10%; Sodium Sulfite 0.5%	(N)	100 V.L.	100 X	100 V.L.	100 V.L.
S. S. 25%; PEG 200 10%; Sodium Sulfite 0.25%	(A)	89 V.L.	75 X	0 L	28 V.L
S. S. 25%; PEG 200 10%; Sodium Sulfite 0.25%	(N)	100 V.L.	100 X	100 X	100 V.L.

*S.S.—Sulfadiazine Sodium Sod. Fom. Sulf.—Sodium Formaldehyde Sulfoxylate
PEG—Polyethylene Alycol

TABLE III. COLOR CHANGE OF SULFADIAZINE SODIUM INJECTION STORED IN PRESENCE OF ARTIFICIAL LIGHT FOR TWO WEEKS EXPRESSED AS PERCENT TRANSMITTANCY AT 500 mu.

FORMULA*		PERCENT TRANSMITTANCY
S. S. 25%	(A)	52.5
S. S. 25%	(N)	88.8
S. S. 25%; Sodium Thiosulfate 0.5%	(A)	39.0
S. S. 25%; Sodium Thiosulfate 0.5%	(N)	100.0
S. S. 25%; PEG 200 10%	(A)	60.0
S. S. 25%; PEG 200 10%	(N)	85.5
S. S. 25%; Sod. Form. Sulf. 0.1%	(A)	34.5
S. S. 25% Sod. Form. Sulf. 0.1%	(A)	34.5
S. S. 25%; Sod. Form. Sulf. 0.1%	(N)	100.0
S. S. 25%; PEG 200 10% Sod. Form. Sulf. 0.1%	(A)	51.5
S. S. 25%; PEG 200 10%; Sod. Form. Sulf. 0.1%	(N)	100.0
S. S. 25; Sodium Thiosulfate 0.1	(A)	13.2
S. S. 25%; Sodium Thiosulfate 0.1%	(A)	13.2
S. S. 25%; Sodium Thiosulfate 0.1%	(N)	90.0
S. S. 25%; PEG 200 10%; Sodium Thiosulfate 0.1%	(A)	20.0
S. S. 25%; PEG 200 10%; Sodium Thiosulfate 0.1%	(N)	93.5
S. S. 25%; Sodium Sulfite 0.1%	(A)	25.5
S. S. 25%; Sodium Sulfite 0.1%	(N)	100.0
S. S. 25%; PEG 200 10%; Sodium Sulfite 0.1%	(A)	30.5
S. S. 25%; PEG 200 10%; Sodium Sulfite 0.1%	(N)	100.00

*S.S.—Sulfadiazine Sodium
PEG—Polyethlyene Glycol
Sod. Form. Sulf—Sodium Formaldehyde Sulfoxylate

tion is correct, the procedure for preparing the injections becomes one of the most critical factors in the stabilization of sulfadiazine sodium injections.

Categoric affirmation of this conclusion cannot be given at this time without further experimentation, but the validity of such a conclusion does not seem too remote in light of the results.

In these studies, the identification of the precipitates which had formed in a number of injections was not concluded. The precipitate could have formed due to a very slight drop in *p*H due to degradation products which had less solubility than the sulfadiazine sodium. This conjecture warrants further experimentation, and the only definite statement that can be made is that certain formulas did not show a precipitate.

Even though a number of these injections which showed color or precipitation were assayed for their sulfadiazine sodium content, they did not vary significantly from the same injections which showed no color or precipitate. It seems reasonable to assume in these instances that (1) either the U.S.P. method of assay is not only selectively detecting the molecule of sulfadiazine, but is also detecting degradation products containing a benzyl amino group or (2) the quantity of the substance causing the color in the injections is so insignificant that the assay cannot detect it.

Proposed Formula

From the information gathered in the one year of study of the stability of sulfadiazine sodium, a formula and a method of preparation are given. Polyethylene glycol has not been included in the formula for no pharmacological evaluation has been published as to its safety when combined with a sulfa drug.

SULFADIAZINE SODIUM INJECTION

Sulfadiazine Sodium U.S.P.	250 Gm.
Antioxidant	1 Gm.
Sodium Sulfite, Exsiccated U.S.P. *or* Sodium Formaldehyde Sulfoxylate	
Water for Injection, to make	1,000 ml.

Preparation

In an all-glass apparatus, heat approximately 900 ml. of Water for Injection to boiling. While cooling to 30 to 35° C., bubble nitrogen into the system. Dissolve 250 grams of sulfadiazine sodium in the water and add 1 gram of the antioxidant. Add sufficient freshly distilled water for injection (saturated with nitrogen) to bring the volume to 1,000 ml. Filter the solution through a sintered glass filter of medium porosity in a nitrogen atmosphere. Fill the ampuls, maintaining a nitrogen atmosphere, and seal.

Sterility

The injection should meet the requirements under Sterility Tests in the U.S.P.

Package

Preserve Sulfadiazine Sodium Injection, in clear single unit ampuls of Type I Glass.

Storage

In storage, do not expose the solution to artificial light or sunlight until used.

Summary

1. A number of formulas of sulfadiazine sodium injection were prepared and studied under several storage conditions.

2. From the experimental evidence, a formula and a method of preparation are suggested.

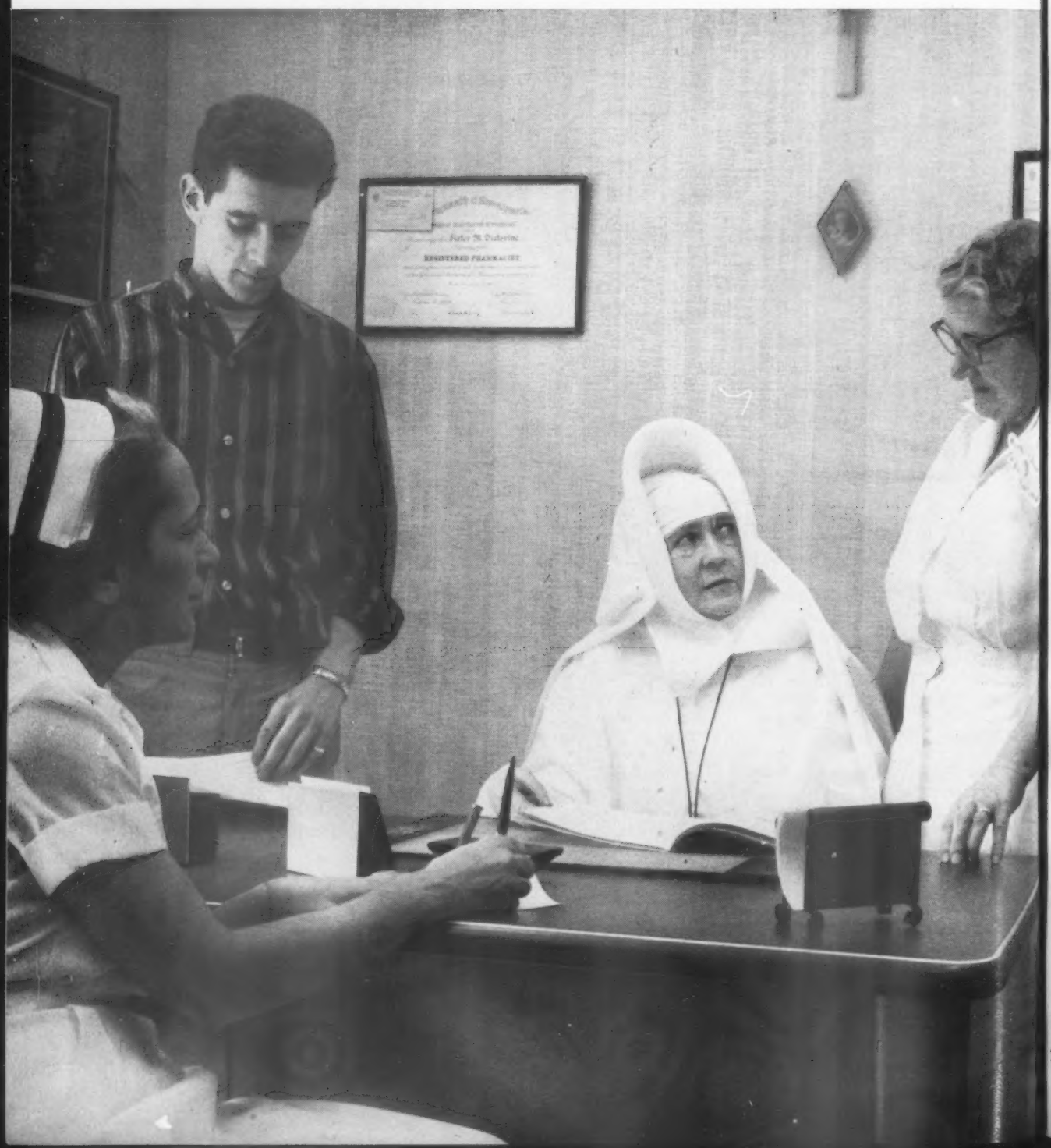
3. Further research is being continued in order to clarify certain aspects of this problem and this evidence will be presented in the near future.

REFERENCES

1. Hom, F. S. and Autian, J.; Study of Stability of Sulfadiazine Sodium Injection I., *J. Am. Pharm. Assoc., Sci. Ed. 45*:608 (Sept.) 1956.

2. *Pharmacopeia of the United States, 15th Revision,* Mack Publishing Co., Easton, Pa., 1955, p. 691.

Sister M. Victorine, shown at her desk, confers with members of the pharmacy staff.



PHARMACY AT ST. VINCENT'S HOSPITAL

by SISTER M. VICTORINE S.P.

WORCESTER HAS MANY EXCELLENT HOSPITALS. Indeed the number and quality of Worcester private and public institutions for the care of the sick and for research into the causes of disease give this area a preeminent place in the fame of Massachusetts for medical science and hospital progress.

Naturally, we are proud of our own hospital, the new and magnificent St. Vincent Hospital which dominates the hills on the Eastern side of our city. The new building has a total bed space of about 600, making it one of the largest general hospitals in New England.

As an architect draws details of a beautiful building before construction, so must the hospital administrator and the chief pharmacist plan to the last item the pharmacy department. The professional pharmacist has ceased to be merely a merchant dealing in drugs. He is now recognized as a highly responsible partner on the health team. The highest type of professional pharmaceutical service in hospitals is necessary and a well equipped, smoothly operating unit is acknowledged to be a necessity of invaluable assistance in providing this professional service to patients.

Ethical and efficient service must be the paramount consideration in this important hospital department. Equipment and personnel are vital elements. A comprehensive and unbiased view must be maintained in the selection of equipment, planning and layout, and in choosing personnel.

A blueprint is drawn up giving a description of the general set-up. That the blueprint may be a workable one, it must be based upon a knowledge of the specific functions to be performed. Thus, our blueprint is based upon the requirements of the 600 bed St. Vincent Hospital at Worcester, Mass.

Functions

The basic functions of the department are filling of clinic prescriptions, ward drug distribution, and manufacturing of a non-sterile nature.

SISTER M. VICTORINE S.P. is Chief Pharmacist at Saint Vincent Hospital, Worcester, Massachusetts.

A convenient method used in filling bottles at St. Vincent's Hospital Pharmacy

The floor area has been divided for proper line-flow production to permit reasonably efficient operation and proper technique for these functions. Medications are furnished to all nursing units and service departments as well as to teaching departments of the Hospital. An inspection of drug cabinets at each nursing station is made at least once each month by the chief pharmacist.

Location

The second floor in the Hospital is devoted to laboratories, Diet and Pathology, X-Ray, EKG, EEG, Central Sterile Supply, Radioisotopes, Physiotherapy, Solution Room, Pharmacy, and Conference rooms. The location of the hospital pharmacy is accessible to all the departments which it serves, especially the outpatient department, where the traffic flow is heavy, also to the elevators and all the nursing stations.

The Pharmacy occupies 3,392 square feet on the second floor, with a storage area of 4,156 square feet of space on the first floor. The Pharmacy area is divided into a pharmacy office, and one large room set up sectionally for manufacturing, prescription area, pharmacy area, and solution area. White ceilings and fluorescent fixtures line the entire pharmacy and office area. Venetian blinds are provided for all windows.

Modern Schwartz cabinets line two walls of the Pharmacy and keep the assortment of drug bottles dust-free. File cards are inserted in especially constructed card enclosures on the fronts of the book-shaped drawers. Two dispensing windows, with steel bars which can be raised and lowered, are provided over an issue counter with linoleum top and open shelves. In addition to the above the following equipment is located within the Pharmacy: narcotic safe, label cabinet, refrigerator, sterilizer, cabinets with glass sliding doors and adjustable shelves, acid resistant birch top work tables including drawers for equipment with shelves arranged above the tables, also one work table, with rack and cut-outs for carboys, soapstone top and trough which is acid resistant, and provided with storage cabinets; stainless steel sinks and drainboards, peg boards, sloping top open shelves, sterile water storage flask and reflux still, desk and typewriter. The walls in this area are painted sea foam green and the floor is covered with brown asphalt tile, to comply with a standard flooring in various departments of the hospital.

The Pharmacy office is equipped with a coat room, lavatory, book cabinet with five shelves, desk and four-drawer file. The walls are covered with greyish white fabron and the floor is grey

and white asphalt tile with black border. The whole unit is well lighted and ventilated and proves a pleasing and cheerful atmosphere for personnel employed in the Pharmacy.

Storage

Our storage area is easily accessible and is divided into two separate units, one for alcoholic storage and the other for general storage purposes. A dumb-waiter directly connects the Pharmacy with the storage room.

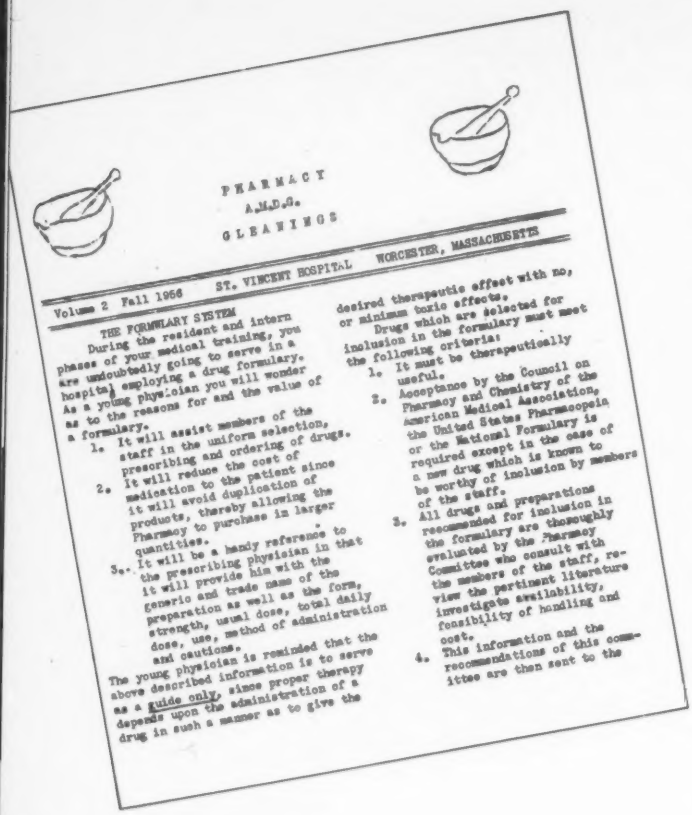
Formulary

The Medicinal Formulary, which was compiled for both hospital and dispensary use, provides a basis for certain policies of the department. It is quite comprehensive in that it assists members of the staff in the uniform selection, prescribing, and ordering of drugs. It reduces the cost of medication to the patient since it will avoid duplication of products, thereby alllowing the Pharmacy to purchase in large quantities, and it is a handy reference to the prescribing physician in that it will provide him with the generic and trade name of the preparation as well as the form, strength, usual dose, total daily doses, use, method of administration, and cautions. The young physician is reminded that this described information is to serve as a guide only, since the proper therapy depends upon the administration of a drug in such a manner as to give the desired therapeutic effect with no, or minimum, toxic effects. In the preparation of the Formulary, every effort was made to provide a liberal selection of pharmaceutical needs to eliminate the necessity of special charges.

Committee On Pharmacy

The Committee on Pharmacy is composed of twelve members, representing each branch of the medical and surgical staff, the Administrator, Chief Pharmacist, Assistant Pharmacist, Director of Nursing Service, and a member of the Nursing School Faculty.

A general view of a portion of the Pharmacy Department at St. Vincent's Hospital



PHARMACY
A.M.D.G.
GLEANINGS

Volume 2 Fall 1966 ST. VINCENT HOSPITAL WORCESTER, MASSACHUSETTS

THE FORMULARY SYSTEM

During the resident and intern phases of your medical training, you are undoubtedly going to serve in a hospital employing a drug formulary. As a young physician you will wonder as to the reasons for and the value of a formulary.

1. It will assist members of the staff in the uniform selection, prescribing and ordering of drugs.
2. It will reduce the cost of medication to the patient since it will avoid duplication of products, thereby allowing the Pharmacy to purchase in larger quantities.
3. It will be a handy reference to the prescribing physician in that it will provide him with the generic and trade name of the preparation as well as the form, strength, usual dose, total daily dose, use, method of administration and cautions.

The young physician is reminded that the above described information is to serve as a guide only, since proper therapy depends upon the administration of a drug in such a manner as to give the desired therapeutic effect with no, or minimum toxic effects.

Drugs which are selected for inclusion in the formulary must meet the following criteria:

1. It must be therapeutically useful.
2. Acceptance by the Council on Pharmacy and Chemistry of the American Medical Association, the United States Pharmacopeia or the National Formulary is required except in the case of a new drug which is known to be worthy of inclusion by members of the staff.
3. All drugs and preparations recommended for inclusion in the formulary are thoroughly evaluated by the Pharmacy Committee who consult with the members of the staff, review the pertinent literature investigate availability, feasibility of handling and cost.
4. This information and the recommendations of this committee are then sent to the

Distribution

Generally speaking all commonly used drugs and medicaments are kept on the nursing wards as stock, available for immediate use. Preparations stocked on the ward by the Pharmacy are either mechanical aids or approved for use under the inclusive rate by admission to the Medicinal Formulary. The Pharmacy is open from 7:30 A.M. to 7:00 P.M. every day including Sundays and holidays.

Each day, nursing units send empty containers to the Pharmacy with requisitions. Containers are filled in accordance with the requisitions and are returned to the wards. The requisitions are used as a basis for establishing standards on nursing wards. Any item not approved as standard for the ward is ordered on a special form (McBee Ticket). Items ordered on the individual request forms are charged to the patient. The requisitions are checked and sent to the accounting departments daily. Empty containers and requisitions arrive at the Pharmacy at 7:30 A.M. and are filled by 9:30 A.M. Emergency requests during the night are cared for through the use of an emergency drug cabinet. The cabinet contains a number of items the need for which is determined by demand. Aside from this there is always a registered pharmacist on call at all times.

Stock Arrangement

The closed cabinets are all numbered and the numbering system continued to include all open shelving in the dispensing room as well as shelves, drawers, and cabinets in the manufacturing and storage rooms. Stock arrangement and classifications is by type of preparation. Clinic prescription stock is segregated from hospital ward stock. Prescriptions are filled mostly from previously prepared stock consisting of Medicinal Formulary items usually. An attempt is made to maintain a stock of prepackaged medications in frequently used prescription units, to expedite service during rush periods in the clinic.

Manufacturing

Certain days of each week are set aside for manufacturing in our Pharmacy. This allows for continuity and much can be accomplished during this time. Special formulas, elixirs, ointments, and solutions are prepared. Parenteral manufacturing is taken care of by the personnel in the solution room.

Outpatient prescriptions are received at our dispensing window. About 40 percent of the prescriptions are packaged. The remainder are filled in the prescription area where most of the Formulary items are conveniently located. We make every effort to see that the outpatient receives the best in medicine such as buffered, isotonic, and preserved ophthalmic solutions. Directions are carefully explained to the patients.

Prescriptions

We dispense about 300 prescriptions for inpatients per day and approximately 200 for outpatients daily.

Stock Maintenance

Perpetual inventory is maintained. Proper arrangement of stock and the alertness of the persons responsible has resulted in a minimum of depletions and, by and large, the only time a shortage of stock has actually occurred is when items were not locally available.

Stock replacement is through purchase orders made out by the pharmacist and given to the purchasing agent. These are made out in triplicate—the original is forwarded to the representative of the supplier, the second copy is kept for the record in the Pharmacy, and the third copy is forwarded to the Receiving Department for the receiving report. Bids on certain drugs

are sent out by the Purchasing Department before purchases are made. Even though purchasing is done through the Purchasing Department the chief pharmacist has complete freedom of specification inasmuch as responsibility for medications dispensed is assigned to her. She also has freedom to purchase items, at her discretion, needed for emergencies from two local suppliers through a blanket order arrangement.

Location

A location file has been established listing each drug alphabetically and indicating not only the location of the drugs in the Pharmacy but also the date of delivery, quantity and price, as well as the specific charges required.

Library

A pharmaceutical library service is provided by the hospital pharmacy. It includes books and literature which are current with drugs being requested. A special literature file has been most beneficial for the resident staff and every comany has offered its literature for distribution to the staff. This file is frequented by the staff and student nurses, and requests are made from time to time for especially interesting items.

Bulletin

A quarterly bulletin is sent to each member of the staff describing new drugs and bringing out valuable information of interest to the staff.

Staff

The personnel consists of two registered pharmacists, a registered nurse, three pharmacy technicians, and a secretary.

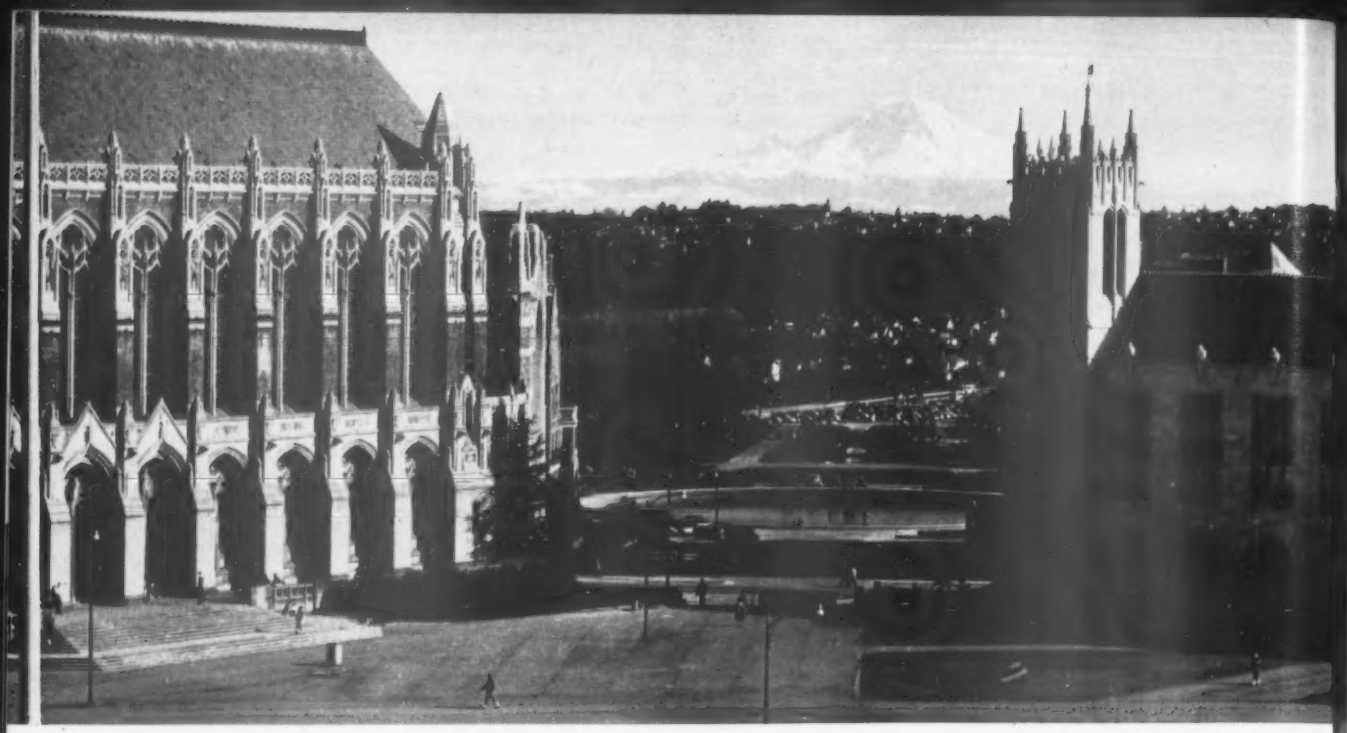
General

Special provisions are made for dispensing narcotics and a vault is provided for their storage. Adequate files are available for records. An alarm system has been installed.

Samples

Samples provided by various drug companies are distributed to familiarize the staff on the use of new drugs. This necessitates only one call on the chief pharmacist.

One of the working areas of the Pharmacy Department at St. Vincent's Hospital



A scene at University of Washington showing Mt. Ranier in the background

seattle

HOSPITAL PHARMACISTS from all parts of the country will have an opportunity to participate in one of the two institutes scheduled during 1957. The first one will be held at the University of Washington, Seattle, Washington, during the week of June 24. The second institute is scheduled at the University of Chicago, Chicago, Illinois, August 19-23. Announcement and registration forms have been sent to all members of the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS as well as to hospital administrators. Registration for the institutes is handled through the American Hospital Association and applications are accepted in the order received. In accordance with the policy for setting up this type of meeting, the number of registrants is necessarily limited.

Terry Hall, University of Washington

Main Lounge, Terry Hall

In each instance—Seattle and Chicago—housing facilities will be available in dormitories at the Universities. Special arrangements have been made for members of religious orders. Meals will be served in the University cafeterias and arrangements for both can be made when your application form is returned to the American Hospital Association.

Again, for the twelfth consecutive year, the American Hospital Association in cooperation with the American Pharmaceutical Association and the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS will sponsor the Institutes. In both cases, the local hospital organizations and the ASHP affiliated chapter in each area are assisting in arranging local plans.

Although the 1957 Institutes will follow the same general pattern, an attempt has been made to permit greater participation by the student body. Following each day's activities, the final period will be devoted to an evaluation of the day's program, and a discussion of individual problems. This will be accomplished by dividing

Prepared by Mr. Joseph Oddis, R.Ph., Staff Representative. Council on Professional Practice, American Hospital Association, Chicago, Ill.

1957 INSTITUTES on hospital pharmacy

the student body into small groups according to the bed capacity of the institution with which the student is associated. A report of these "Clinic Sessions" will be made on the final day of the Institutes.

Another session designed specifically for student participation will be the Wednesday evening session appropriately called "Stump the Experts." A panel, composed of faculty members, will be prepared to answer specific questions. Students are encouraged to bring problems to the panel's attention for their consideration.

Practical equipment for the hospital pharmacy will be displayed at both Institutes. Mr. Paul F. Parker will coordinate the demonstrations at Seattle and Mr. Pete Solyom, at Chicago. Students wishing to display a "gadget" or practical pieces of equipment are asked to contact Mr. Parker and Mr. Solyom.

Other important sessions will deal with communications and human relations, the operation and function of pharmacy committees, the control of poisons, handling radioisotopes and considerations in the preparation of parenteral solutions. Complete programs with tentative faculty appointments are included.

Local Committees

Members of the Washington State Hospital Pharmacists are taking a leading role in making special arrangements for Institute enrollees. The Society has offered to provide transportation from the Seattle-Tacoma airport on the Sunday prior to the Institute and details of the arrangements will be sent to those who register.

In Chicago, the Illinois Society of Hospital Pharmacists will assist in making local arrangements. At both Institutes, preliminary registration and an informal coffee hour will be featured on the Sunday evening preceding the Institute. A social hour, scheduled for Monday evening, will offer an unusual opportunity for relaxation and entertainment. These functions are sponsored by the respective local societies.

chicago

Burton-Judson Court, residence hall at University of Chicago.

Seattle

INSTITUTE PROGRAM

MONDAY, JUNE 24

GROVER BOWLES, *Presiding*

8:00 A.M. Registration

9:00 A.M. Invocation and Greetings
University of Washington
HENRY SCHMITZ
University of Washington, College of Pharmacy
JACK ORR
Washington Hospital Association and American Hospital Association
JOHN BIGELOW
American Pharmaceutical Association
PAUL F. PARKER
American Society of Hospital Pharmacists
LEO F. GODLEY
Washington State Hospital Pharmacists
JOSEPH E. BIRMINGHAM

9:30 A.M. Orientation for Participants

9:45 A.M. The Expanding Responsibilities of the Hospital in Public Health

10:30 A.M. Recess

10:45 A.M. Hospital Administration and Organization
JOHN A. DARE

11:30 A.M. Expanding Responsibilities of the Pharmacist in the Hospital
PAUL F. PARKER

12 Noon Luncheon

1:30 P.M. Entire afternoon is to be devoted to Communications and Human Relations
DONALD NYLEN, *Moderator*

4:30 P.M. Clinic Session

8:00 P.M. Social—Sponsored by Local Committee of the Washington State Hospital Pharmacists. Dutch Treat.

TUESDAY, JUNE 25

JOSEPH A. ODDIS, *Presiding*

9:00 A.M. Organization of the Pharmacy and Therapeutics Committee
JEROME YALON

9:30 A.M. Panel Discussion:
The Pharmacy and Therapeutics Committee in Action
LEO GODLEY, *Moderator*
FACULTY MEMBERS

10:30 A.M. Recess

10:45 A.M. Pharmacy Services to the Nursing Department.
GROVER BOWLES

11:15 A.M. Panel Discussion:
The Pharmacy—Nursing Committee in Action
GROVER BOWLES, *Moderator*
NURSING STAFF—Swedish Hospital, Seattle.

12 Noon Luncheon

1:30 P.M. Responsibility of the Hospital Pharmacist for Drug Information
LEO F. GODLEY

2:00 P.M. Utilization of Information Sources
CLIFTON LATIOLAIS

2:30 P.M. Teaching Responsibilities of the Hospital Pharmacist
GEORGE F. ARCHAMBAULT

3:00 P.M. Recess

3:15 P.M. Oral Anti-Diabetic Agents

4:00 P.M. Writing for Publication
HOWARD M. BRIER

4:30 P.M. Clinic Session

WEDNESDAY, JUNE 26

LEO GODLEY, *Presiding*

9:00 A.M. Training Programs in Hospital Pharmacy
PAUL F. PARKER

9:30 A.M. Control of Hospital Infections

10:15 A.M. Recess

10:30 A.M. Panel Discussion:
Economic Poisons and Their Control
JOSEPH E. BIRMINGHAM, *Moderator*
DONALD SUTHERLAND
CLARENCE ROZGAY
TED LOOMIS

11:15 A.M. Physical Plans for the Hospital Pharmacy
GEORGE F. ARCHAMBAULT

12 Noon Luncheon

1:30 P.M. Considerations in Inpatient Dispensing
JACK HEARD

2:15 P.M. Considerations in Outpatient Dispensing
THEODORE T. TANIGUCHI

3:00 P.M. Recess

3:15 P.M. Panel Discussion:
Practical Equipment for the Hospital Pharmacy
PAUL F. PARKER, *Moderator*

4:30 P.M. Clinic Session

7:00 P.M. Panel Discussion:
"Stump the Experts"
JOSEPH A. ODDIS, *Moderator*
FACULTY MEMBERS

THURSDAY, JUNE 27

ROBERTA DODDS, *Presiding*

9:00 A.M. Bulk Compounding in the Hospital Pharmacy
THEODORE T. TANIGUCHI

9:30 A.M. Formulations and Product Development
CLIFTON LATIOLAIS

10:00 A.M. Recess

10:15 A.M. Current Trends in Antibiotic Therapy

11:00 A.M. Prepackaging Hospital Pharmaceuticals
CHARLIE TOWNE

11:30 A.M. Special Considerations in Labeling Problems
JACK HEARD

12 Noon Luncheon

1:30 P.M. Hospital Pharmacy Records
FRANK HOLLISTER

2:15 P.M. Hospital Pharmacy Purchasing
GROVER BOWLES

3:00 P.M. Recess

3:15 P.M. Panel Discussion:
Drug Charging Problems
JEROME YALON, *Moderator*
JOSEPH E. BIRMINGHAM
JOHN BIGELOW
ROBERT F. BROWN

4:30 P.M. Clinic Session

7:00 P.M. Panel Discussion:
Handling Radioisotopes in Hospitals
CLIFTON LATIOLAIS, *Moderator*
LAUREN DONALDSON
N. B. EVERETT
THOMAS CARLYLE

FRIDAY, JUNE 28

GEORGE F. ARCHAMBAULT, *Presiding*

9:00 A.M. Panel Discussion:
Considerations in the Preparation of Parenteral Solutions
GROVER BOWLES, *Moderator*
FACULTY MEMBERS

10:00 A.M. Recess

10:15 A.M. Controls in the Manufacture of Parenteral Solutions
LEO GODLEY

11:15 A.M. Clinic Session Reports

1:00 P.M. Luncheon and Awarding of Certificates
JACK ORR

Chicago

INSTITUTE PROGRAM

MONDAY, AUGUST 19

GROVER C. BOWLES, *Presiding*

8:00 A.M. Registration

9:00 A.M. Invocation and Greetings
University of Chicago
LOWELL COGGESHALL
American Hospital Association
RAY E. BROWN
American Pharmaceutical Association
PAUL F. PARKER
American Society of Hospital Pharmacists
LEO F. GODLEY
Illinois Society of Hospital Pharmacists
WINSTON DURANT

9:30 A.M. Orientation for Participants

9:45 A.M. The Expanding Responsibilities of the Hospital in Public Health
LOWELL COGGESHALL

10:30 A.M. Recess

10:45 A.M. Hospital Administration and Organization
RAY E. BROWN

11:30 A.M. The Expanding Responsibilities of the Pharmacist in the Hospital
PAUL F. PARKER

12 Noon Luncheon

1:30 P.M. The entire afternoon is to be devoted to Communications and Human Relations.
VERNE KALLEJIAN, *Moderator*

4:30 P.M. Clinic Session

8:00 P.M. Social—Sponsored by Local Committee of the Illinois Society of Hospital Pharmacists. Dutch Treat.

TUESDAY, AUGUST 20

JOSEPH A. ODDIS, *Presiding*

9:00 A.M. Organization of the Pharmacy and Therapeutics Committee

9:30 A.M. Panel Discussion:
What About the Formulary System?
LEO GODLEY, *Moderator*
KENNETH BABCOCK
DON E. FRANCKE
WRIGHT ADAMS
LOUIS GDALMAN
RAY E. BROWN

10:30 A.M. Recess

10:45 A.M. Pharmacy Services to the Nursing Department
GROVER BOWLES

11:15 A.M. Panel Discussion:
The Pharmacy - Nursing Committee in Action
GROVER BOWLES, *Moderator*
Nursing Staff - University of Chicago Clinics, Chicago.

12 Noon Luncheon

1:30 P.M. Responsibility of the Hospital Pharmacist for Drug Information
LEO GODLEY

2:00 P.M. Utilization of Information Sources
GLORIA N. FRANCKE

2:30 P.M. Teaching Responsibilities of the Hospital Pharmacist
W. WILLIAM TAYLOR

3:00 P.M. Recess

3:15 P.M. Oral Anti-Diabetic Agents
GERALD SOBEL

4:00 P.M. Writing for Publication
JAMES HAGUE

4:30 P.M. Clinic Session

WEDNESDAY, AUGUST 21

LEO GODLEY, *Presiding*

9:00 A.M. Training Programs in Hospital Pharmacy
PAUL F. PARKER

9:30 A.M. Control of Hospital Infections
MARK H. LEPPER

10:15 A.M. Recess

10:30 A.M. Panel Discussion:
Economic Poisons and Their Control
GLORIA N. FRANCKE, *Moderator*
EDWARD HARTSHORN
CHARLES LEV
BERNARD CONLEY

11:15 A.M. Physical Plans for the Hospital Pharmacy
CLIFTON LATIOLAIS

12 Noon Luncheon

1:30 P.M. Utilization of Nonprofessional Personnel

2:15 P.M. Legal Aspects of the Utilization of Nonprofessional Personnel
ARTHUR BERNSTEIN

3:00 P.M. Recess

3:15 P.M. Bulk Compounding in the Hospital Pharmacy
WINSTON DURANT

3:45 P.M. Formulations and Product Development
CLIFTON LATIOLAIS

4:30 P.M. Clinic Session

7:00 P.M. Panel Discussion:
"Stump the Experts"
JOSEPH A. ODDIS, *Moderator*
FACULTY MEMBERS

THURSDAY, AUGUST 22

GLORIA N. FRANCKE, *Presiding*

8:30 A.M. Hospital Pharmacy Records
W. WILLIAM TAYLOR

9:00 A.M. Hospital Pharmacy Purchasing
GROVER BOWLES

9:30 A.M. Prepackaging Hospital Pharmaceuticals
ALLEN BECK

10:00 A.M. Recess

10:15 A.M. Special Considerations in Labeling Procedures
PETER SOLYOM

10:45 A.M. Panel Discussion:
Drug Charging Problems
DON E. FRANCKE, *Moderator*
PETER SOLYOM
LOUIS GDALMAN
JAMES NEELEY

12 Noon Luncheon

1:30 P.M. Chemotherapy of Leukemia
MILA PIERCE

2:15 P.M. Panel Discussion:
Considerations in the Preparation of Parenteral Solutions
GROVER BOWLES, *Moderator*
FACULTY MEMBERS

3:00 P.M. Recess

3:15 P.M. Controls in the Manufacture of Parenteral Solutions
LEO GODLEY

4:30 P.M. Clinic Sessions

7:00 P.M. Tour: University of Chicago Clinics

FRIDAY, AUGUST 23

DON E. FRANCKE, *Presiding*

9:00 A.M. Handling Radioisotopes in the Hospital
UNIVERSITY OF CHICAGO STAFF AND FACULTY

11:00 A.M. Recess

11:15 A.M. Clinic Session Reports

1:00 P.M. Luncheon and Awarding of Certificates
ALAN E. TRELOAR

TENTATIVE FACULTIES

SEATTLE

ARCHAMBAULT, GEORGE F., Chief, Pharmacy Branch, Division of Hospitals, Department of Health, Education and Welfare, Washington 25, D. C.

BIGELOW, JOHN, Executive Secretary, Washington Hospital Association, 37 Skinner Building, Seattle 1, Washington.

BIRMINGHAM, JOSEPH E., Director, Pharmacy Service, Veterans Administration Hospital, 4435 Beacon Avenue, Seattle 5, Wash.

BOWLES, GROVER C., Director, Pharmacy Service, Baptist Hospital, Memphis, Tenn.

BRIER, HOWARD M., Faculty, School of Communications, University of Washington, Seattle, Wash.

BROWN, ROBERT F., Administrator, The Doctors Hospital, Seattle, Wash.

CARLYLE, THOMAS, Virginia Mason Hospital, Seattle, Wash.

DARE, JOHN A., Administrator, Virginia Mason Hospital, 1101 Terry Ave., Seattle 1, Wash.

DODDS, ROBERTA E., Director, Pharmacy Service, Swedish Hospital, Seattle, Wash.

DONALDSON, LAUREN, School of Fisheries, University of Washington, Seattle, Wash.

EVERETT N. B., Department of Anatomy, University of Washington, Seattle, Wash.

GODLEY, LEO F., Director, Pharmacy Service, Bronson Methodist Hospital, Kalamazoo, Mich.

HEARD, JACK, Chief Pharmacist, University of California Medical Center, Los Angeles, Calif.

HOLLISTER, FRANK W., 3906 Northeast, White, Portland, Oregon.

LATIOLAIS, CLIFTON, J., Assistant Program Director, Audit of Pharmaceutical Service in Hospitals, University Hospital, Ann Arbor, Mich.

LOOMIS, TED, Toxicologist, State of Washington, Faculty, University of Washington, Seattle, Wash.

NYLEN, DONALD, Assistant Superintendent, Seattle Public School System, 815 - 4th Ave., North Seattle, Washington

ORR, JACK, Dean, College of Pharmacy, University of Washington, Seattle, Wash.

PARKER, PAUL F., Director, Division of Hospital Pharmacy, American Pharmaceutical Association, 2215 Constitution Ave., N.W., Washington 7, D. C.

ROZGAY, CLARENCE, 4364-15th, South, Seattle 8, Wash.

SCHMITZ, HENRY, President, University of Washington, Seattle, Wash.

SUTHERLAND, DONALD, The Bellevue Clinic, Wash.

TANIGUCHI, THEODORE T., Director, Pharmacy Service, King County Hospital, Pharmacy, Seattle 4, Wash.

TOWNE, CHARLES C., Director, Pharmacy Service, Veterans Administration Center, Wilshire-Sawtelle, Los Angeles 25, Calif.

YALON, JEROME, 1778 - 33rd Ave., San Francisco 22, Calif.

CHICAGO

ADAMS, WRIGHT, Chief, Department of Medicine, University of Chicago Clinics, Chicago, Ill.

BABCOCK, KENNETH, Director, Joint Commission on Accreditation of Hospitals, 660 North Rush St., Chicago, Ill.

BECK, ALLEN V. R., Director, Pharmacy Service, Indiana University Medical Center, Indianapolis, Ind.

BERNSTEIN, ARTHUR, American Hospital Association, Chicago, Ill.

BOWLES, GROVER C., Director, Pharmacy Service, Baptist Hospital, Memphis, Tenn.

BROWN, RAY E., Superintendent, University of Chicago Clinics, Chicago, Ill.

COGGESHALL, LOWELL, University of Chicago, Chicago, Ill.

CONLEY, BERNARD, Secretary, American Medical Association, Committee on Pesticides, 535 North Dearborn Ave., Chicago 10, Ill.

DURANT, WINSTON, Assistant Director, Pharmacy Service, University of Chicago Clinics, Chicago, Ill.

FRANCKE, DON E., Chief Pharmacist, University Hospital, University of Michigan, Ann Arbor, Mich.

FRANCKE, GLORIA N., Secretary, American Society of Hospital Pharmacists, 1812 Norway Road, Ann Arbor, Mich.

GDALMAN, LOUIS, Director, Pharmacy Service, St. Luke's Presbyterian Hospital, 1439 South Michigan Ave., Chicago 5, Ill.

GODLEY, LEO F., Chief Pharmacist, Bronson Methodist Hospital, Kalamazoo, Mich.

HAGUE, JAMES E., Executive Editor, Hospitals, Journal of the American Hospital Association, Chicago, Ill.

HARTSHORN, EDWARD A., Director, Pharmacy Service, Evanston Hospital, Evanston, Ill.

KALLEJIAN, VERNE, American Hospital Association, Chicago, Ill.

LATIOLAIS, CLIFTON J., Assistant Program Director, Audit of Pharmaceutical Service in Hospitals, University Hospital, Ann Arbor, Mich.

LEPPER, MARK H., Department of Preventive Medicine, University of Illinois, Chicago, Ill.

LEV, CLARENCE C., Director, Pharmacy Service, Michael Reese Hospital, 2839 South Ellis Ave., Chicago 16, Ill.

PARKER, PAUL F., Director, Division of Hospital Pharmacy, American Pharmaceutical Association, 2215 Constitution Avenue, N.W., Washington 7, D. C.

PIERCE, MILA, Department of Medicine, University of Chicago Clinics, Chicago, Ill.

NEELY, JAMES, Assistant Director of Research, American Hospital Association, Chicago, Ill.

SOBEL, GERALD, Resident and Interns' Quarters, Michael Reese Hospital, 2839 South Ellis Ave., Chicago 16, Ill.

SOLYOM, PETER, JR., Director, Pharmacy Service, University of Chicago Clinics, Chicago, Ill.

TAYLOR, W. WILLIAM, Director, Pharmacy Service, North Carolina Memorial Hospital, Chapel Hill, North Carolina.

TRELOAR, ALAN E., Director of Research, American Hospital Association, Chicago, Ill.

The Council of the Federation Internationale Pharmaceutique in session at Hamburg

F. I. P. meeting in Hamburg

Forty-three delegates representing 24 countries and including the officers of the Federation and representatives of the Sections met in Hamburg September 28 and 29, 1956 at the invitation of the Arbeitsgemeinschaft der Berufsvertretungen Deutscher Apotheker. In opening the meeting, President Sir Hugh Linstead welcomed the Honorary President of the F.I.P., Dr. E. Höst Madsen, and expressed appreciation to the pharmacists of Germany for their generous hospitality. In discussing the Council of the Fédération Internationale Pharmaceutique, Sir Hugh said, in part:

"The Council of F.I.P. can be a body of great authority. It is the international parliament of pharmacy and we want to see its meetings becoming increasingly valuable to the national societies which compose our Federation. Two things are necessary to achieve this. The first is continuity of membership of the Council. It is particularly important for an international body meeting only once a year that its members should not be frequently changing. They must remain in office long enough to be able to understand the problems with which they are dealing, to maintain continuity of policy and—probably the most important of all—to get to know their colleagues on the Council personally so that the Council becomes not a meeting of individuals but a team of Friends.

"The second need is for the national societies, through their spokesmen who are the members of this Council, to take an active part in our work. Your Secretariat-General cannot invent an agenda paper in a vacuum nor can we of this Council propose solutions to international problems without drawing upon the experience of national societies. I hope to see in an increasing degree items put upon our agenda by the national societies and I hope also that members of this Council will consult with their national societies about the agenda so that they can express to us the views of those whom they represent.

"Side by side with this interest in our work by our members we have seen in the last few years a vigorous activity on the part of our sections. I am hoping that

SIR HUGH LINSTEAD, *President of the Federation Internationale Pharmaceutique presiding at the meeting of the F.I.P. Council.*

as a result of proposals which will come before you at this meeting we shall give our Scientific Section a fresh impetus and enable it to enlarge its activities.

"To some of those who remember the work of F.I.P. before the war the very vigour of the development of our sections may appear frightening. But there is nothing artificial in this growth. It is a natural response to an obvious international need that we must not be dismayed but accept it as a natural development and as an indication that our Federation is doing its duty. . .

"My hope as your President is to see the two wings of pharmacy—science and professional practice—equally developed and strongly developed in our Federation. It is with that in mind that I particularly welcome the developments in our Scientific Section foreshadowed in the proposals to be made to us by Professor Ruyssen and Professor Steiger. No less important will be the increasing place in our deliberations which must be taken by the problems of the practising pharmacist. We shall have an interim report at this Council meeting from the Commission presided over by M. Frank Arnal with the assistance of M. Pierre Martinot as Secretary, and I look forward at our next General Assembly in Brussels to some fruitful discussion of the conclusions of the Commission.

"Finally let me express the hope that at this meeting, as always, we shall bear in mind that our interests are not limited to pharmacy as a science or to pharmacy as a profession. In the International Pharmaceutical Federation we are concerned with pharmacy as part of the International framework of civilization. In that field we of F.I.P. have still many questions to solve. We have to work out our relations with the Asian Countries, with the U.S.S.R. and with the Pan-American Congress of Pharmacy. In approaching these problems we must be prepared to take wide views and to look at national problems from an international angle. It is not enough to cultivate our garden. We must look over the garden wall. We are fortunate in that there is one thread of unity running through all that we do and transcending all national interests. That thread is the status of the individual pharmacist as a professional man. No matter in what country he practices his profession nor what are the legal requirements which regulate his professional work he can only properly serve his community if he accepts personal responsibility for all his professional activities. If need be he must be protected against the State, or against an employer who seeks to impose upon him standards alien to the professional standards of pharmacy. The measure by which he must work is his own professional conscience. It is the duty of his national society and of the International Pharmaceutical Federation to support and encourage him along this road. That is the basic purpose of our meeting here today and I hope it will animate us in all our work."

F.I.P. Bulletin

The Council approved the appointment of Dr. P. Degand of Belgium as Editor-in-Chief of the *Bulletin of the International Pharmaceutical Federation* and adopted a budget for its publication for 1957.

This action followed discussions by representatives of the Press and Documentation Section in which suggestions for the reorganization of the *F.I.P. Bulletin* were made. Dr. Ulisse Gallo of Italy reported conclusions reached by a special commission to study the problem. The commission recommended that: (1) the size of the *Bulletin* should not be altered; (2) four issues should be published each year; (3) official communications should be printed in four languages; and (4) original papers should be printed in the language used by the author with summaries in one or two other languages.

Dr. Don E. Francke, representing the Press and Documentation Section, proposed that consideration be given to publishing four separate language editions of the *Bulletin*, all under the direction of an Editor-in-Chief but with the addition of a separate editor for each language edition. He further suggested the name of the publication be changed to the *World Journal of Pharmacy* with the subtitle *Official Publication of the International Pharmaceutical Federation*, and that each language edition be supported in part by advertising from pharmaceutical companies doing business in the countries of distribution.

Dr. Degand was requested to consider these recommendations, and others proposed by members of the Council, in making final plans for the *F.I.P. Bulletin*.

Scientific Section

The President of the Scientific Section, Doctor R. Ruyssen of Belgium, announced that the 17th International Congress of Pharmaceutical Sciences will be held under the auspices of the F.I.P. in Leiden, The Netherlands, during September 12 to 14, 1957. The program will consist of a series of scientific papers plus a symposium on Heparin, which will be discussed from its biochemical, clinical, pharmaceutical, and physiological aspects. Applications for the Congress may be obtained by writing to the Pharmaceutical Institute of the University, 32 Hugo de Grootstraat, Leiden, The Netherlands.

Dr. Kurt Steiger of Switzerland, Secretary of the Scientific Section, supplemented Dr. Ruyssen's discussion of the need for a world center for the preparation of pharmaceutical abstracts. Dr. Steiger proposed that such a center be established in Switzerland and that pharmaceutical abstracts be issued in the form of cards which may be easily classified and filed. In order to establish the pharmaceutical documentation on a scientific and university level, Dr. Steiger suggested that faculty members from the various countries be invited to serve as abstracters. Following the discussion, Professor Ruyssen appointed a Commission to study the problem and to make a proposal no later than 1958. Members of the Commission include Dr. Ulisse Gallo of Italy, Dr. Don E. Francke of the Press and Documentation Section, Dr. T. Potjewijd of The Netherlands, and Mr. L. Charial of France.

Commission for Practice of Retail Pharmacy

The Chairman of the Commission, Mr. Frank Arnal of France, made an extensive report of the Commission's activities during the past year and also defined the scope of the work undertaken. A portion of the Commission's final report will deal with the problem of Social Security and especially, the manner in which it may affect the practicing pharmacist. In studying this and other matters, the Commission has emphasized the fundamental professional responsibility of the pharmacist for service to the sick. The Commission came to the conclusion that the future development of the profession of pharmacy would be influenced by the problems imposed by social evolution. Mr. Arnal briefly discussed the report of Miss Boss, which was presented to the General Assembly of the Association Internationale de la Mutualité at Interlaken in 1955. This report deals primarily with the misuse of pharmaceuticals.

In order to expedite the preparation of a comprehensive report, the work has been subdivided and assigned to several committees. Mr. M. Hardy of Belgium and Mr. H. Meyer of Germany will investigate the representation of retail pharmacists in social organizations dealing with health matters and the relationship of the insured to the social organization. Mr. Sv. E. Björn of Denmark will study the guarantees for the quality of pharmaceuticals. A reply in defense of pharmacy to the implications expressed in the report of Miss Boss will be prepared by Dr. Spillmann of Switzerland. The wording of an international code of ethics for pharmacists will be composed by Mr. Frank Arnal of France. Mr. J. Lesur of France will prepare an organized summary of the several reports presented.

Patent Medicine Commission

This Commission met in Stockholm on September 21 and 22, and drafted a set of principles regarding pharmaceutical advertising. The proposed principles are as follows:

1. Advertising, whether it be addressed to the public or to those practicing the art of healing, must conform to the truth; it must have respect for the laws and moral traditions of the country to which it is addressed; it must not offend the aesthetic sense of the public; it must not exploit superstition or credulity or those sentiments of fear which the public has in regard to certain diseases.

2. It is not permissible in advertising texts to use categorical statements that are likely to raise hope of a certain cure.

3. In advertising material directed to the public it is not permissible to use testimonials of cure or photographs or other documents describing the condition of sick persons before or after treatment.

4. Fictitious testimonials or references to doctors, clergymen and scientists unknown or even nonexistent are especially condemned.

5. It is reprehensible to make use of papers represented as results of original research when they have not been submitted to free scientific discussion and the control which results from it.

6. All forms of advertising liable to mislead the reader or listener as to the real value and properties of a medicine are condemned.

7. All forms of advertising addressed to the public concerning medicines recommended for the treatment of social diseases or serious illnesses such as tuberculosis, cancer, venereal disease, etc., and encouraging the sick person to attempt self-treatment without the supervision of a qualified medical practitioner, should be forbidden.

President Sir Hugh Linstead suggested that the report concerning advertising be referred to the Section of Industrial Pharmacists for study and comment before final action is taken by the Council.

The Patent Medicine Commission also presented the following definition of a manufacturing batch. "A batch is an entity of manufacture, which, resulting from a single or from one and the same series of manipulations, finally constitutes a homogeneous whole, that is to say, it is identical in all its parts, taking into account the statistical laws relating to dispersion."

Commission on International Congresses and General Assemblies

The Commission proposed that there be two types of congresses. The first type would be congresses of the Fédération Internationale Pharmaceutique which would always include a General Assembly as part of the program. The General Assemblies would be the official meetings of the F.I.P. In addition, there would be the Congress of Pharmaceutical Sciences. The series of these latter congresses starts with the 17th which will be organized in Leiden in 1957. The next combined Congress and General Assembly of the F.I.P. will be held in Brussels September 8-15, 1958. This meeting will coincide with the International Exhibition which will be held in Brussels during 1958.

Section of Hospital Pharmacists

Professor Jean Cheymol of Paris, President of the Section of Hospital Pharmacists, gave a survey of the activities of this Section and stated that 19 countries had been represented at the meeting in London and that he anticipated a still greater representation at the meeting in Brussels. The theme for the meeting of the Section of Hospital Pharmacists in Brussels will be the overall legal responsibility of the hospital pharmacist with reference to safety practices in dispensing drugs to patients in order to avoid accidents and medication errors.

Section of Industrial Pharmacists

The President of the Section of Industrial Pharmacists, Mr. C. W. Robinson of Great Britain, informed the Council that the Section now has three sub-sections; (1) a sub-section for the unification of the labeling of toxic substances; (2) a sub-section for the regulations imposed by different governments for the registration and sale of specialties; and (3) a sub-section for the study of the educational requirements for those seeking careers in the pharmaceutical industry. The latter subsection is now engaged in a study to determine the situation which exists in the various countries. The Section of Industrial Pharmacists has also undertaken a study of the modern problem of the coloring of tablets.

Mr. Jack Cooper, Director of Pharmacy Research and Development of Ciba Pharmaceutical Products, Inc., is the American representative of the Section of Industrial Pharmacists. Application blanks for membership in this Section may be obtained by writing to him at Summit, New Jersey.

Section of Military Pharmacists

Doctor Jean Reusse of France, Secretary of the Section of Military Pharmacists, reported that the activities of the Section have increased greatly during the past few years. Numerous studies are now being undertaken and full reports will be given at the F.I.P. meeting in Brussels in 1958. Mr. S. J. Relph of Great Britain, Vice President of the Section, will report on measures for health protection among the civil population. Other reports will deal with functions of the pharmacist in the military service in relation to his professional status, and technical problems obtaining in the military service relative to the stability of galenical remedies. In addition, results of other studies and surveys will be reported at the meeting in Brussels. The final report will contain data from all countries and will be compiled by military pharmacists from the United States and Yugoslavia.

Press and Documentation Section

In reporting for the Press and Documentation Section, Dr. Don E. Francke reviewed plans for the new *F.I.P. Bulletin* and reminded the Council that the Section would hold a special meeting in Paris where plans for the publication of the *Bulletin* would be discussed.

Admission of New Members

The Pharmaceutical Societies of Czechoslovakia and of Romania were admitted as new Ordinary Members of the Federation.

Fair Trade

Mr. M. Costello of Ireland presented a report regarding the interference by the Irish Fair Trade Commission in the professional and commercial activities of pharmacists. The Fair Trade Commission had held that the occupation of compounding and dispensing medical prescriptions was not a profession and could be inquired into by the Commission. The Irish Pharmaceutical Society appealed this decision to the Supreme Court. In the appeal, the Society won a major issue in obtaining the admission of the Supreme Court that pharmacy is a profession.

American Associate Members

The International Pharmaceutical Federation

The following American pharmacists and organizations are Associate Members of the International Pharmaceutical Federation.

Associate membership in the Fédération Internationale Pharmaceutique is open to all American pharmacists who are members of their national professional organizations. Associate Members receive the Bulletin of the Federation which contains many of the papers presented at the Federation meetings as well as other articles concerning various phases of pharmacy throughout the world.

Those pharmacists who wish to join the Fédération Internationale Pharmaceutique may do so by submitting their name, title and address, together with a check for $2.75.

DON E. FRANCKE
American Representative F.I.P.
University Hospital
Ann Arbor, Mich.

Adams, Carsbie C., Atlanta, Ga.
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American Institute of the History of Pharmacy, Madison, 6, Wis.
American Society of Hospital Pharmacists, Washington 7, D. C.
Archambault, George F., Bethesda 14, Md.
Arizona Society of Hospital Pharmacists, Phoenix, Ariz.

Banning, Jennie M., Saginaw, Mich.
Bavly, Ben, New Orleans 12, La.
Beard, Henry W., Portland 5, Ore.
Beaty, Mary Bak, New York 17, N.Y.
Beck, Allen V. R., Indianapolis, Ind.
Bender, George A., Detroit 32, Mich.
Berger, Calvin, New York, N.Y.
Berman, Alex, Ann Arbor, Mich.
Blythe, Rudolph H., Philadelphia 1, Pa.
Bonow, Eunice R., Milwaukee 3, Wis.
Bowles, Grover C., Memphis 3, Tenn.
Branson, Joanne, Ann Arbor, Mich.
Brochmann-Hanssen, E., San Francisco 22, Calif.
Brodie, Donald, San Francisco 22, Calif.
Brown, Ruth E., Seattle 3, Wash.
Bunce, Allen H., Atlanta 3, Ga.
Bundt, Charles R., Toledo, Ohio
Burlage, Henry M., Austin 5, Texas
Busick, Claude, Stockton, Calif.

Canaipi, Victor V., Providence, R. I.
Carlin, Evelyn M., Paterson 4, N. J.
Carlo, Pierre-Emmanuel, Philadelphia 1, Pa.
Cataline, Elmon L., Albuquerque, N. Mex.
Chow, Calvin C. M., San Francisco, Calif.
Claus, Jacqueline, Houston, Texas
Coburn, Thelma Morris, Birmingham, Ala.
Coghill, Mrs. Robert D., Lake Bluff, Ill.
Cole, Paul F., Skokie, Ill.
Collier, Halcyone B., St. Petersburg, Fla.
Colunga, Hilda, New York 23, N.Y.
Committee on Hospital Pharmacy Practice, Catholic Hospital Association, St. Louis 4, Mo.

Conti, Marie, Long Island, N.Y.
Cook, E. Fullerton, Media, Pa.
Cooper, Jack, Summit, N. J.
Costello, P. H., Chicago 5, Ill.
Creighton University Pharmacy Library, Omaha 2, Nebr.
Crotwell, Johnnie, Atlanta, Ga.

Daiell, H. L., Milwaukee 1, Wis.
Davidov, Hyman, Baltimore 17, Md.
Dellande, Armand J., St. Louis 9, Mo.
Deno, Richard A., Ann Arbor, Mich.
deNavarre, M. G., Detroit 2, Mich.
Dental Pharmacy Library, Temple University, Philadelphia 40, Pa.
Dunning, H. A. B., Baltimore, Md.

Eliot, Eustace E., Milwaukee 3, Wis.

Falzine, Esther L., Cleveland 2, Ohio
Fiege, Robert W., Indianapolis, Ind.
Fink, William T., Philadelphia, Pa.
Fischl, Louis J., Oakland, Calif.
Flack, Herbert L., Philadelphia 7, Pa.
Fletcher, Gilbert W., Ann Arbor, Mich.
Fontanet, Josephine, Miami Beach, Fla.
Foster, Thomas A., Washington 25, D. C.
Fox, Sereck H., Detroit, Mich.
Francke, Don E., Ann Arbor, Mich.
Francke, Gloria N., Ann Arbor, Mich.
Franzoni, F. Royce, Arlington 7, Va.
Frazier, Walter M., Springfield, Ohio
Frey, L. L., Washington 9, D. C.

Gdalman, Louis, Chicago 5, Ill.
Geiger, E. Burns, Brooklyn 6, N.Y.
Gibson, Arthur J., Ann Arbor, Mich.
Gillen, John F., Jr., Long Island, N.Y.
Glassbrenner, Irwin, Pittsburgh 12, Pa.
Goldman, Goldie, Brooklyn 19, N.Y.
Gooch, John M., Washington 8, D. C.
Gotthelf, Irma, Norwich, Conn.
Greco, James J., Coytesville, N. J.
Green, Melvin W., Chicago 5, Ill.
Griffenhagen, George, Washington 25, D. C.

Hackett, Joseph P., New York 13, N.Y.
Halpern, Alfred, New York 13, N. Y.
Hardt, Robert A., Nutley 10, N. J.
Heinz, Jack, Salt Lake City 2, Utah
Heller, William M., Little Rock, Ark.
Herholdt, Fred D., Dover, Del.
Heyer, Ursula, Baltimore 5, Md.
Hocking, G. M., Auburn, Ala.
Holland, Madeline Oxford, Meadowbrook, Pa.
Hubble, Else Carr, Centralia, Wash.
Huyck, C. L., St. Louis 10, Mo.

Inashima, Osamu James, Boston 8, Mass.

Jacobs, Sadie, Long Island, N.Y.
Jacobson, Raphael, Chicago 39, Ill.
Jeffers, Cedric M., Temple, Texas
Jenkins, Glenn L., Lafayette, Ind.
Jensen, Raymond, Birmingham, Mich.
Jones, Hurd M., Jr., Houston 4, Texas

Kaiser, David G., Grosse Pointe 30, Mich.
Kenny, J. R., Jr.
Ketcham, Basil P., Philadelphia 43, Pa.
Klein, Karl F., Aberdeen, S. Dak.
Kuck, Marie Bukovsky, San Francisco 12, Calif.
Kunkel, Frank E., Cincinnati 27, Ohio

Lantos, Robert E., Galveston, Texas
Latiolais, Clifton J., Ann Arbor, Mich.
Lawson, Robert E., Denver, Colo.
Levin, Sam D., Minneapolis 11, Minn.
Lille, Henri H., Pasadena 7, Calif.
Lisaius, Joseph I., West Caldwell, N. J.
Litman, Abe, Pittsburgh 6, Pa.
Little, Ernest, Peacham, Vt.
Lukaszewicz, John J., Buffalo 11, N.Y.

MacCartney, John A., Detroit 32, Mich.
Maicki, Henry J., Detroit 24, Mich .
Markuze, Abraham L., Philadelphia 26, Pa.
McDermott, Charles B., New York 18, N.Y.
McDonnell, John N., Bloomfield, N. J.
Meredith, Donald T., Kalamazoo, Mich.
Meriano, Constantine N., Boston 8, Mass.
Miale, Joseph P., Mount Vernon, N.Y.
Midrack, Eleanore, Cleveland 11, Ohio
Miller, Lloyd C., New York 16, N.Y.
Moir, John G., Vancouver 8, B.C., Canada
Mordell, J. Solon, Bethesda 14, Md.
Moss, Belle, Detroit 6, Mich.
Mueller, Florence, University City 24, Mo.
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therapeutic TRENDS

edited by WILLIAM JOHNSON

Dicumarol—In Sicklemia

The management of sicklemia to the present has been restricted to the transfusion of whole blood during the frequent crises of hemolytic anemia. No remedy has been found that will beneficially influence the underlying abnormality or any of the well known secondary manifestations. In view of the fact that embolism resulting from thrombosis is the usual immediate cause of death and that thrombosis is likewise the cause of many of the most distressing complications, it was postulated that long-term therapeutic trial of anticoagulant management was justified.

A trial course of long-term anticoagulant therapy in a case of sickle-cell anemia is reported by Adelson in *New England J. Med.* 256:353 (Feb.21) 1957. The apparently beneficial and encouraging results are described. It is suggested that this therapeutic approach justifies further trial and evaluation.

Hydrocortisone—In Pneumococcal Meningitis

Mortality rates in pneumococcal meningitis treated with penicillin and sulfadiazine vary from 27 to 70 percent. The prognosis is even graver in elderly patients. The mortality rate ranges from 50 to 90 percent in patients who are more than 50 years old. In *Univ. Mich. Med. Bull.* 22:329 (Aug.) 1956, Verner *et al* report the successful treatment of a 76 year-old diabetic patient with pneumococcal meningitis with combined steroids and antibiotics. It was decided to use hydrocortisone and corticotropin for two theoretical reasons—(1) to suppress exudate formation in the meninges and prevent development of subarachnoid block, and (2) to decrease toxicity and fever until the infection could be controlled. The advantages of using steroids in this infection would seem to outweigh the hazards, provided that adequate antibiotic treatment is carried out at the same time.

Triiodothyroacetic Acid in Coronary Disease

In euthyroid men with coronary disease triiodothyroacetic acid (Triac) lowered the plasma-cholesterol, the cholesterol/phospholipid ration, and the proportion of cholesterol attached to b-lipoprotein without raising the basal metabolic rate. The dosage of Triac that will produce this dissociation varies from patient to patient, but the optimum is usually 3 to 4 mg. daily or six to eight times what is required by hypothyroid patients.

Oliver and Boyd report in *Lancet* I:124 (Jan. 19) 1957 that in three out of 12 men normally good exercise-tolerance was reduced, and angina developed or was greatly aggravated. In one of these three, Triac raised the B.M.R. The reduction of exercise-tolerance is therefore not surprising. In the other two the B.M.R. did not change, yet their exercise-tolerance was diminished. It has been suggested that Triac may increase the oxygen requirements of the myocardium without causing any observable increase in the B.M.R. The fall in plasma-cholesterol level could not be maintained for long even by increasing the dosage of Triac. It is concluded by these workers that Triac may not prove suitable for the long-term control of hypercholesterolemia in patients with clinical coronary disease.

Parabens—Antifungal Activity

This study was prompted by the fact that there have been reports in the literature describing the successful application of parabens for chemotherapy, and more recent information indicates that these compounds may be effective in preventing complications of antibiotic therapy caused by secondary fungus infections. In *Antibiot. and Chemotherap.* 7:29 (Jan.) 1957, Huppert reports that for this study a homologous series of *n*-alkyl esters of *para*-hydroxybenzoic acid were synthesized through the member containing 16 carbon atoms in the *n*-alkyl radical. The most effective of the homologues are the hexyl and heptyl esters except when a particular fungus is so sensitive as to be inhibited even by the very low concentrations obtained with the highly insoluble esters. The results indicate that the most active parabens are considerably more effective than some other antifungal agents. The hexyl and heptyl esters inhibit representative strains of most of the fungi known to cause disease in humans particularly those fungi producing

systemic disease. It is suggested that the most active of these parabens be investigated for controlling systemic myotic infection in experimental animals.

Miamycin—An Antibiotic

A strain closely resembling *S. ambofaciens* was found to produce, in addition to a spiramycin-like complex, another related antibiotic. From its chemical and physical properties it appeared to be previously undescribed. The organism producing this antibiotic was isolated from a sample of Miami, Fla. soil—hence the proposed name, miamycin. Miamycin shows little activity against strains of *M. pyogenes* var. *aureus* made resistant to erythromycin and carbomycin. It has a low order of toxicity in mice and exerts a therapeutic action against sensitive strains in low concentrations. This work was reported by Misiek *et al* in *Antibiot and Chemotherap. 7:37* (Jan.) 1957.

Isoniazid Allergy—Immunization With Isoniazid

Under certain circumstances it may be particularly important for a patient to receive isoniazid although he is allergic to it. Brown *et al* describe in *Am. Rev. Tuberc. 74*:783 (Nov.) 1956 the successful immunization of two patients who were allergic to isoniazid. In the course of treatment of these patients for tuberculosis isoniazid was added to the chemotherapeutic regimen and they immediately developed reactions which were determined to be of allergic type. The reactions were of such serious nature that the drug had to be discontinued. It was decided to attempt immunization with isoniazid since no other course seemed advisable. The schedule of doses is presented which started with the subcutaneous injection of 0.1 ml. of a solution containing 0.1 mg./ml. of isoniazid and gradually increased to an oral dosage of 100 mg. three times daily. These workers believe that allergy to isoniazid in hospitalized tuberculous patients does not necessarily preclude the use of the drug and that in these cases immunization should be attempted.

Dyclone—A Topical Anesthetic

Dyclone is a white crystalline powder which is soluble in water (2 percent Dyclone in water) with a resultant stable, slightly acidic solution. The solution of Dyclone has bactericidal and fungicidal properties. Using *Staphylococcus aureus* as the test organism, the absolute phenol coefficient is 3.6. Hughes *et al* report of 569 procedures in *J. Thoracic Surg. 32*:135 (July) 1956 on the use of Dyclone in peroral endoscopy. Solution concentrations of 0.5 percent and 1.0 percent were used in this study. The time required for good anesthesia is about 6 minutes and anesthesia lasts from 30 to 40 minutes. This allows adequate time for performance of the desired examination and also allows recovery from anesthesia before the patient leaves the clinic. Dyclone (1 percent solution; 5 ml. 15 minutes a.c.) has been used to alleviate the pain of esophagitis in 15 patients receiving deep X-ray treatment for nonresectable carcinoma of the lung. The pain of swallowing is alleviated partially or entirely but patients complain of inability to taste and numbness of the tongue. Two percent solutions of Dyclone are non-irritating and no sensitivity has been reported. Dyclone (dyclonine HCl) is 4-n-butoxy-beta-piperidino propiophenone hydrochloride and was supplied by Pitman-Moore Co.

Alloxan—In Primary Carcinoma of the Liver

In the experimental field there is evidence that the production of alloxan diabetes in rats almost entirely prevents the induction of hepatomas and inhibits tumor growth or reduces the mortality rate in rats receiving implants of carcinoma (but not sarcoma). Hepatocellular carcinoma in man is invariably fatal, usually 4 to 6 weeks after clinical diagnosis. In view of the foregoing experimental and clinical data, Gillman *et al* considered it worthwhile to study the effects of alloxan on patients with primary hepatic carcinoma. The results of their study are published in *Lancet* I:80 (Jan. 12) 1957.

Alloxan 70 to 150 mg. per Kg. body weight was administered intravenously, over a period not exceeding one minute, as a fresh 20 percent solution of alloxan monohydrate in distilled water. These doses are known to be diabetogenic for most animals. In a series of four cases treated in this manner the following is reported: cessation of pain in 1 case; reduction of liver size in 3 cases; extensive sclerosis in both primary and secondary tumors; the unusually long survival of 1 case (with a rapidly growing hepatocellular carcinoma) for more than 5 months after onset of symptoms; and the absence of hyperglycemia and glycosuria after alloxanization. In a later series of 3 patients on this therapeutic regimen, one patient developed total anuria lasting for 4 days, confirming the potentially nephrotoxic action of alloxan.

timely drugs

Bendectin

. . . for anti-nausea therapy, has recently been announced by Wm. S. Merrell Co. It has been reported highly effective for the symptomatic relief of morning sickness of pregnancy. It combines three drugs which have anti-nausea action but which are more effective in combination than when used alone. The usual dosage of Bendectin for nausea of pregnancy control is two tablets at bedtime. In severe cases of nausea, symptomatic relief may be obtained by administering one tablet on arising and repeating in mid-afternoon. Each coated tablet contains Bentyl (dicyclomine, Merrell) hydrochloride 10 mg., Decapryn (doxylamine) succinate 10 mg., and pyridoxine hydrochloride 10 mg. The tablets are available in bottles of 100.

Dilantin Sodium Steri-Vials

. . . for the treatment of status epilepticus and the control of seizures in neurosurgery, is now marketed by Parke, Davis & Company. In all cases optimal dosage must be determined by trial. Dosage in excess of that which will just prevent convulsions is not recommended. For the treatment of status epilepticus, Dilantin sodium should be injected intravenously at a rate not exceeding 1 ml. of solution, containing 50 mg. per ml. per minute. A dosage of from 150 to 250 mg. intravenously is usually administered in severe conditions. It may be used for the prophylactic control of seizures in neurosurgery. In surgery involving brain tumors, subdural hematoma, or vascular lesions, the patients may be protected against convulsions both during surgery and in the immediate postoperative period with a dosage of 100 to 200 mg. intramuscularly three or four times during the 24-hour period encompassing the period of surgery and the postoperative phase.

Dilantin sodium is prepared in the Steri-Vial using the special solvent provided for that purpose. Aseptically, 5 ml. of the solvent is added to the vial and shaken gently; the contents normally dissolve in about 10 minutes. Each Steri-Vial contains 250 mg. of Dilantin sodium, packaged with 5 ml. of the special solvent.

Incremin

. . . effective in many cases of poor appetite and slow growth, is now available from Lederle Laboratories in a new, highly palatable tablet form. Caramel flavored, the new Incremin tablets can be dissolved in the mouth, chewed, or swallowed. It is also available as cherry-flavored drops in a convenient 15 ml. plastic bottle for mixing with milk or food. Each tablet contains lysine hydrochloride 300 mg., vitamin B-12 25 mcg., thiamine hydrochloride 10 mg., pyridoxine hydrochloride 5 mg., and alcohol one percent, and is available in bottles of 30 tablets.

Mycifradin Pediatric Solution

. . . a solution of Mycifradin (neomycin, Upjohn) sulfate for oral use, is now available from the Upjohn Co. Neomycin is used orally for preoperative preparation of the bowel and for the treatment of certain diarrheal disorders. This pleasantly flavored solution is designed primarily for pediatric use.

Mycifradin sulfate is indicated in the treatment of diarrhea due to certain pathogenic strains of *E. coli* and other neomycin-susceptible organisms. The daily dosage for diarrhea is calculated on the basis of 15 to 30 mg. of neomycin sulfate per pound of body weight divided into four equal doses. For preoperative preparation of the bowel, the recommended dosage is calculated on the basis of 40 mg. of the sulfate per pound of body weight and is administered in six equal doses at four-hour intervals. The duration of treatment will depend on the clinical response.

Each ml. of the pediatric solution contains 25 mg. of neomycin sulfate (equivalent to 17.5 mg. of neomycin base). The solution is supplied in pint bottles.

Neraval

. . . an ultra-short acting thiobarbiturate for intravenous use, has been released by Schering Corp. It may be employed in a full range of operative procedures, including major abdominal, plastic and resective surgery, and minor surgery on ambulatory outpatients. It is also indicated in procedures such as reduction of fractures and dental surgery. The duration of effect with Neraval sodium is notably shorter than with the older short-acting barbiturate anesthetics. Significantly greater milligram quantities of Neraval are generally used compared with thiopental. In all situations, dosage must be determined from the response of the patient, taking into consideration the nature and timing of premedication, the type of operative procedure, the depth of anesthesia desired, and the concomitant use of supplemental anesthetic or muscle relaxant agents. Neraval (methitural, Schering)

sodium is packaged as a dry, sterile powder in vials of 1, 2, and 5 Gm.

Optef Eye Drops

. . . a new product of the Upjohn Company, is unique among their adrenocortical steriod eye preparations in that the hydrocortisone (as the free alcohol) is present in solution rather than as a suspension of the acetate. The preparation is therefore well tolerated, minimizes crystal deposition in or on the cornea, and obviates any subjective sensation of grittiness when placed in the conjunctival sac. It is indicated in the same conditions as the Neo-Cortef and Neo-Delta-Cortef ophthalmic preparations. However, since this preparation does not contain neomycin, local and/or systemic antibiotic therapy should be employed in conjunction with topical application in the presence of bacterial infection. Optef 0.2 percent eye drops contains in each ml.: hydrocortisone 2 mg., in a buffered isotonic solution, preserved with chlorobutanol 0.5 percent. The solution is packaged in 2.5 ml. bottles with droppers.

Pen Vee Cidin

. . . for the symptomatic relief of the common cold and prevention of bacterial complications, has been released by Wyeth. It is especially useful in patients highly susceptible to colds or other upper respiratory infections. The usual precautions regarding antibiotics and antihistamines apply. The dosage is two capsules to initiate the regimen, then one or two capsules every six to eight hours. Due to the acid stability of penicillin V, they may be taken at mealtime. If temperature is elevated, treatment should be continued for 48 hours after it returns to normal and the acute symptoms have subsided. Each Pen Vee *Cidin* capsule contains penicillin V 62.5 mg. (100,000 units), salicylamide 194 mg., promethazine hydrochloride 6.25 mg., phenacetin 130 mg., and mephentermine sulfate 3 mg. The capsules are packaged in bottles of 36.

Regutol

. . . brand of dioctyl sodium sulfosuccinate, is now available as 100 mg. tablets from Pharmaco, Inc. Regutol, the new surface wetting agent, effective eases defecation by softening day, hard feces. The dosage is generally one tablet three times daily. Regutol tablets are available in bottles of 100 and 500 tablets.

Sumycin

. . . the new chemical form of tetracycline for broad-spectrum antibiotic therapy, is now available from E. R. Squibb & Sons. This new phosphate complex provides well-tolerated and fully effective antibiotic medication. It is readily absorbed from the gastrointestinal tract, producing high blood levels within a short period of time, and it diffuses readily into body tissues. The suggested minimum adult dose of Sumycin (tetracycline phosphate complex, Squibb) is 250 mg. four times daily. Higher dosages may be required for severe infections. The pediatric dosage should be 10 to 20 mg. per pound of body weight each day in divided doses. As with the use of any broad-spectrum antibiotic, the patient should be carefully watched for signs of secondary infection caused by nonsusceptible organisms, especially monilia. Sumycin capsules, each containing the equivalent of 250 mg. of tetracycline hydrochloride, are supplied in bottles of 16 and 100.

Tetrex

. . . the phosphate complex of tetracycline, has just been announced by Bristol Laboratories, Inc. It provides faster, higher, more efficient blood levels than the hydrochloride salt within one to three hours of administration of a single dose. Its indications as a broad-spectrum antibiotic are the same as those for tetracycline hydrochloride. The dosage of Tetrex is 250 mg. administered four times daily; severe or prolonged infections require higher doses. Each capsule is equivalent to 250 mg. of the hydrochloride salt and is packed in bottles of 16 and 100 capsules.

Tryptar Ointment

. . . for all skin conditions attended with necrotic tissue, has recently been released by the Armour Laboratories. It is indicated in superficial skin lesions, indolent ulcers, thermal and chemical burns (2nd and 3rd degree), decubitus ulcers, and other lesions of the skin attended with necrotic tissue, secondary infection, hard eschar or phagedenic membrane. Otitis externa, acute and chronic, responds rapidly to treatment with the ointment. Antigenicity to trypsin and chymotrypsin has not been reported. Occasional transient slight itching immediately after application has been noticed. It is applied once or twice daily and the lesion may then be covered with dry gauze. Usually two to four days of treatment will cleanse the wound and permit natural healing. Tryptar ointment contains in each gram: crystalline trypsin 5,000 Armour units; crystalline chymotrypsin 5,000 Armour units; bacitracin 500 units; polymyxin B sulfate 5,000 units; in a specially prepared water-washable ointment base. It is available in 15 Gm. tubes.

Ultran

. . . a new mild tranquilizing drug which calms anxiety states in patients without affecting their mental alertness, sensitivity of perception, or dexterity, has been released by Eli Lilly & Co. One of a series of butanediols, Ultran (phenaglycodol, Lilly) appears to act as an interneuronal blocking agent. It is indicated when a pacific effect is desirable. It is beneficial in patients who are afflicted with emotional instability, anxiety-tension states, or functional disorders. Although Ultran will usually alleviate emotional tension, it will not eliminate the abnormalities or basic difficulties that gave rise to the symptom. The drug is relatively free from undesirable side effects. Its low toxicity and relative freedom from the production of euphoria, tolerance, and physical dependence make it suitable for treating patients where prolonged use is required.

For most patients a dosage of 300 mg. of Ultran administered three times daily will suffice. In certain instances, a patient may take two capsules (600 mg.) before retiring to promote a restful night. Each turquoise and white capsule contains 300 mg. of Ultran, and the capsules are supplied in bottles of 100.

selected pharmaceutical abstracts

and summaries of other articles interesting to hospital pharmacists

edited by LEO F. GODLEY *and* CLIFTON J. LATIOLAIS

INCOMPATABILITY OF DYES

The Coloring of Mercuric Chloride Solutions, Steel, K. J. and Brown, W. R. L., Pharm. J. 178:60 (Jan. 26) 1957.

The addition of methylene blue to concentrated mercuric chloride solutions, intended for dilution before use, results in a rapid formation of a flocculent, indiffusible, purple precipitate with a colorless supernatant liquid. The precipitate is soluble upon dilution or heating. In the experiment cationic dyes were incompatible with mercuric chloride suggesting that chemical inter-actions rather than a "salting out" is the mechanism of the incompatibility. Of all the blue dyes, indigo carmine and trypan blue are the dyes of choice being non-staining and compatible with high concentrations of mercuric chloride.

NORMAN HO

NALORPHINE AS ANALGESIC

Nalorphine, a Potent Analgesic in Man, Keats, A. S. and Telford, J., J. Pharmacol. Expt. Therap. 117:190 (June) 1956.

Nalorphine represents a long-sought potent non-addicting analgesic although retaining a high side action liability. It not only fails to endure abstinence syndromes following abrupt withdrawal or support morphine addiction in man, but precipitates acute abstinence syndromes in addicts.

The analgesic potency of nalorphine was determined in postoperative patients and compared to morphine. The experimental design was discussed. There were no significant differences between the nalorphine and morphine analgesia curves and between the duration of action. Approximately 15 mg. of nalorphine is the analgesic equivalent of 10 mg. morphine. Some limited data on side action liability were presented and their relationship to the clinical use of nalorphine as a routine narcotic was discussed. The administration of both nalorphine and morphine to the same subject confounds the true potency and side action liability of nalorphine and both should not be given to the same patient to attain the full analgesic effect.

NORMAN HO

BARBITURATE POISONING

Report on Barbiturates, Subcommittee on Barbiturates, New York Academy of Medicine, Bull. N. Y. Acad. Med. 32:456 (June) 1956.

In view of the alarming incidence of both fatal and non-fatal barbiturate poisoning in the United States (about 1/5 of all instances of drug poisoning in the United States is due to barbiturates), the Committee on Public Health of the New York Academy of Medicine undertook an extensive survey of misuses and legislation in respect to barbiturates—one of the 10 most valuable drugs available to physicians.

The Committee found that misuse fell into 4 categories: (1) habitual self-medication; (2) substitution for narcotics or alcohol; (3) accidental overdosage; and (4) intentional overdosage for either self-destruction or quick relief.

The effects of misuse were considered in detail including quite conclusive definitions of both habituation and addiction—emphasizing here that addiction, even though not frequent, may develop following a prolonged period of increasingly high dosages of barbiturates. It is also interesting to note that habitual daily use of barbiturates at therapeutic levels, even for long periods, is not necessarily injurious—low grade tolerance and psychic dependance may be the only clinical symptoms.

A great deal of statistical data has been compiled for the period of 1939 through 1954. The major conclusions drawn are as follows:

1. Rate* of incidence is much higher in large cities than in the whole United States.
2. Suicidal attempts contribute the major portion of total non-fatal poisonings.
3. Rate* of both accidental and suicidal death from barbiturates has been greater in England and Wales than in the United States since approximately 1950.
4. The rate of female deaths from either cause, in all areas considered, was found to exceed that of male deaths.

Misuse of barbiturates can occur either through or without the power of a prescription. There are four situations in which a prescription can be considered as a source of supply contributing to misuse: (1) physicians may prescribe for mentally disturbed patients unaware of possible suicidal tendencies or their inability to follow his directions. It is an open question in this situation whether the prescription is ill-advised, especially since the physician must try to bring relief to the patient; (2) prescribing beyond the immediate need of the patient for economy of time or money—the patient again may use unwise judgment; (3) over-the-counter sale by a pharmacist also will be covered with a prescription from a collaborating physician who never sees or meets the purchaser; and (4) dispensing beyond the amount specified on the prescription.

Misuse without a prescription can be accomplished through three means: (1) through an over-the-counter sale; (2) through the supply of a helpful friend; and (3) through illegal traffic in a black market.

This import upon the public health of our nation has led to a loud demand for stiffer laws and regulations governing commerce in barbiturates. Some have called for a more restrictive Federal control—but this approach at present seems insurmountable if not formidable when combined with their already gigantic task of coping with illicit narcotic traffic.

It is recommended, therefore, that enforcement of existing state and city laws be explored first by employing the model bill entitled "Hypnotic or Somnifacient Drugs Act" (drafted by the Council of State Governments which appeared in its report on Suggested State Legislation Program for 1955) as a framework.

In conclusion, the model law should be adopted by all states (only 13 have done so at present). More stringent laws will not, however, compensate for an insufficient number of inspections; therefore, efforts at enforcement should be increased and concentrated especially in the large cities. And finally, since the cause leading to misuse of barbiturates may very likely be due to (1) public inadequately informed of the risks involved, or (2) too much anxiety and tension within the public —educational and research campaigns should be aimed in this direction.

* Per million population

THEODORE J. BENYA

SCIENTIFIC HONESTY

Scientific Communications Should Be Improved, Decker, F., Science 125:101 (Jan. 8) 1957.

Some questions of ethics and communications have grown during the past decade which now threaten to hamper critically the status of science in modern society. These questions demand review and action by the various professional fields of the scientific community in order to improve scientific communications.

The techniques require special scrutiny when they involve technologic developments which have economic implications. "Scientific facts" may be proclaimed by several parties and the public becomes thoroughly confused by sharply conflicting "scientific" conclusions. Conflicting reports on lung cancer, polio vaccine, fluoridation, cloud seeding, and radiation dangers demonstrate the need for researchers to give special attention to examining their means of communication with one another and with the public on the results of scientific investigations.

The questions raised in this article cite illustrations drawn from the controversial field of cloud

seeding but the counterparts to these illustrations are applicable to most other scientific areas.

What constitutes scientific evidence? The primary concern of everyone in this scientific age is validity of data. Unqualified testimonials have no standing against objective tests. The term "scientifically proved" can fall into public disrepute unless scientists insist on a standard of objectivity for data.

What constitutes scientific experimentation? Well designed experiments are the results of careful planning and consultation. Extraneous factors must be removed from the operations leading to the comparisons.

How much proof must be offered to support conclusions? Conclusions must be based on a careful analysis of all pertinent data. There can be no suppression of inconvenient data that contribute to statistical variation thereby blurring or undermining the conclusion.

What scientific work must be published by ethical researchers? The whole structure of science is based on free exchange of information and not on the hoarding total security of the alchemist. Those who want to retain trade secrets should not give the impression that they are speaking as scientists if they mention results without giving substantial basis for their conclusions.

How should technical details of scientific research be described in popular releases? A real contribution can be made toward better public understanding of science by adopting more specific and understandable language. The language used should be understandable to the elements of society concerned with making decisions on the basis of such reports.

How should scientists describe the nature of their discoveries? Scientists should remind all concerned that in their conclusions there is always a margin of uncertainty. The science of statistics furnishes excellent means for defining the area of uncertainty.

Will overstatement of results choke off future development? There are uncertainties in this area because of the possible impact of the shift in financial support. However, if progress is to be made, uncertainties must be faced frankly, not submerged by glittering claims of success.

Can an unsettled technical process be exploited commercially prior to full verification? The scientist is under obligation to lend support and assistance to submit to impartial tests on claims for new techniques whenever the name of science is used to sell the innovation to the public.

Can scientists assist in making decisions when "scientific proof" seems to be lacking? Scientists should avoid the use of such vague expressions as "statistically significant" and instead, use language that clearly distinguishes the results as an estimate of business risk which does not imply proof.

What must scientists do to assure acceptance of their work as authentic? Public recognition and confidence in scientific results can be accomplished through the cultivation of ethical practices in science. Scientists, who are retained by the buyer, and then enter the services of the seller may cause one to become suspicious of even valid findings.

Can science afford an absence of open criticism? The critics' valuable role in scientific progress could be stifled if the scientific community does not rally to insist on recognition for those who call for scientific proof, not advertising claims.

How can science gain better understanding and appreciation from the public? The best hope to this problem is in developing a realization that discoveries can occur only if they already exist in nature. This fundamental should be understood by all people if they are not to be disappointed and in order that they will continuously support the methodical work aimed at satisfying human needs and desires.

CLIFTON J. LATIOLAIS

QUALITY OF TABLETS

Barbiturate Tablets, A Survey, Bagnall, H. H. and Stock, F. G., Pharm. J. 177:441 (Dec. 8) 1956.

A total of 343 samples of different barbiturate tablets from commercial manufacturers was examined to determine whether these products conformed with the disintegration test and the uniformity test of the *British Pharmacopoeia.*

The uniformity test of the *British Pharmacopoeia* places upon manufacturers the obligation to produce tablets which vary in weight only within narrow limits.

The total sample represented 13 basic barbiturates and some mixed barbiturate proprietaries. Thirty-six manufacturers were represented. A table indicates the numbers of samples taken of various barbiturates together with the number of these samples which did not meet the pharmacopeial standards of one kind or another. The great majority of the faults discovered were failures to pass the disintegration test, but some cases did not comply with the uniformity test and occasional samples contained excesses or deficiencies of the active ingredient.

There were startling differences between the tablets of different manufacturers in respect to quality. Four manufacturers represented 83 samples and no fault could be found with any of them. On the other hand, of 67 samples of tablets manufactured by two firms, no fewer than 42 had to be rejected.

Out of the total of 343 sample barbiturate tablets tested, 79 (or 23%) did not meet the British Pharmacopoeial requirements of one kind or another.

A number of the samples which did not pass the test could actually be immersed in water for a week or more without any softening taking place.

CLIFTON J. LATIOLAIS

POLIO VACCINE

Supply, Distribution and Use of Poliomyelitis Vaccine, Holdeman, Jack C., Pub. Health Reports 72:9 (Jan.) 1957.

The voluntary system of Federal allocation of polio vaccine was terminated on August 1, 1956. Decontrol of vaccine was made possible because (1) (production) supply was able to meet the demand; (2) a number of states did not request their shares of vaccine released during late June and July 1956.

Termination of the allocation system does not affect allotment of Federal funds available to the states for purchase of polio vaccine for children under 20 and expectant mothers. Funds amounting to $53,600,000 were allocated through the Poliomyelitis Vaccination Assistance Act and will be available until June 1957.

The development of the polio vaccine intensifies the need for laboratory confirmation of all cases of polio and polio-like diseases. The vaccine may modify the course of the disease, thus making diagnosis on purely clinical grounds more difficult. A network of laboratories has been organized by the Communicable Disease Center of the Public Health Service to provide for testing and analysis of specimens taken from patients with polio or polio-like diseases.

CLIFTON J. LATIOLAIS

ACTION OF TRANQUILIZERS

The Nature of Drugs with Mental Actions and Their Relation to Cerebral Functions, Pennes, H. H., Bull. N.Y. Acad. Med., 33:81 (Feb.) 1957.

The tranquilizers, also known as ataraxics or phrenotropics, are agents producing a general reduction of psychomotor activity, emotional calming, reduced anxiety and anxiety to external stimuli, and some drowsiness. Qualitatively, they are superior to the barbiturates since the mental subject is easily aroused to alert contact with the environment with less mental clouding and impairment of thinking.

Chlorpromazine and reserpine are the most widely used and effective tranquilizers; meprobamate is less therapeutically effective in highly disturbed states. The comparative pharmacology of chlorpromazine and reserpine is reviewed. Both drugs have significant autonomic effects, which explain many of their clinical effects and not their tranquilizing actions. Experimentally, chlorpromazine depresses (1) the reticular activating system, which has been related with the level of consciousness and responsiveness, but not yet correlated with emotional states, and (2) the limbic system, which is probably involved with emotional reaction to the environment. These evidences partly explain the tranquilizing effects of chlorpromazine. On the other hand, reserpine exerts definite excitant effects on the reserpine activating system and lowers the threshold for the electrical stimulation of the limbic system.

According to the National Institutes of Health, the central actions of reserpine are mediated through serotonin released from the bound state of brain serotonin. There is evidence that serotonin, 5-hydroxytryptamine, functions as a neuro-humoral transmitter and is present in its highest concentration in the brain stem, particularly the hypothalamus. Of the most interesting pharmacological evidence, LSD-25 (lysergic acid diethylamide), a hallucinogenic or psychotomimetic agent, exerts a specific and potent antagonisim of the various effects of serotonin. According to one concept, the mechanisim of antagonisim is competitive inhibition on an antimetabolic basis since serotonin, LSD-25, and other known hallucinogens contain an indole nucleus in their chemical structures. This would mean that serotonin in the brain keeps us sane. Mescoline, a primary amine with a resemblance to epinephrine and nor-epinephrine, also produces hallucinations and other perceptual disturbances, emotional aberrations, depersonalization and disturbances in the thought process. Chlorpromazine and meprobamate have no effect on the release of serotonin. Because the chemical structures and pharmacological actions of chlorpromazine, reserpine, and meprobamate do not correlate and often conflict with each other, a fundamental mechanisim of tranquilization seems unlikely.

NORMAN HO

COLOR IN MEDICAMENTS

Carter, S. J.: Colouring of Medicaments, Arguments for and Against, The Alchemist (London) 20:616 (Nov.); and 20:669 (Dec.) 1956; 21:27 (Jan.) and 21:79 (Feb.) 1957.

Color in pharmaceuticals has 4 main purposes: (1) To make preparations more acceptable to patients; (2) To serve as a warning on poisons; (3) For identification; and (4) To produce standard preparations. The *British Pharmacopoeia* does not allow the use of color in capsules, tablets or tablet coatings, with two exceptions. The *British Pharmaceutical Codex*, however, although following this same procedure, extends it to include pills and compressed lozenges, but does permit some color in tablet coatings, and recommends coloring of many solutions. Colors generally accepted in the Codex for internal use are red, orange, yellow and brown. By contrast, the *U.S.P.* allows color in capsules and coatings if it is harmless and does not interfere with assays and tests. The *International Pharmacopoeia* contains no recommendations concerning coloring.

Arguments for the inclusion of color in pharmaceuticals are (1) attractiveness of color is valuable for pediatric medication; and (2) uncolored pharmaceuticals have a disadvantage in commerce. On the other hand, arguments against color in pharmaceuticals are (1) color appeal may be a factor in childhood poisonings; and (2) uncolored tablets may be more adequately identified chemically.

In 1950 a subcommittee of hospital pharmacists of the Codex Revision Committee made recommendations for colors in non-injectible solutions. Five principles were observed in preparing their color scheme: (1) color should not be used for identification; (2) Pharmacopoeial and Codex dyes only should be used; (3) Topical analgesics should be a different color from all other non-injectible solutions; (4) Violet should be avoided, especially for industrial methylated spirit, because it is used for methylated spirit; and (5) Solutions used for storing ampuls should contain enough dye to permit detection of cracked ampuls. These principles were accepted but have not as yet been practiced to a great extent. This method of coloring solutions has potential dangers unless it is made obligatory. Again, the danger of relying on color instead of the label is emphasized.

Coloring of solutions for injection is not advised since the addition of color indicates that the preparation is not suitable for injection, based on the principles for coloring non-injectible solutions.

With the notable exception of cochineal, vegetable and animal dyes have been replaced by the synthetic coal tar dyes. The ideal coloring material has the following properties: (1) It must not be injurious to health nor have physiologic activity; (2) It should be a definite, predictable chemical compound; (3) It should be water-soluble, although some oil-soluble and alcohol-soluble colors are necessary; (4) It should have high tinctorial ability so that small quantities may be used; (5) It should be physically stable, unaffected by heat, light, long storage, etc; (6) It should not be affected by pH or oxidizing and reducing agents; (7) It should be compatible with medications and not interfere with tests and assays on them; (8) It should not be appreciably absorbed on suspended material; (9) It must not have an objectionable odor or taste; and (10) It must be easily available and inexpensive. In general, synthetic dyes have more of these properties than those of natural origin.

Disadvantages of vegetable and animal colors are: (1) Many have physiologic affects in varying degrees; (2) Coloring power and standardization are often unreliable; (3) Few are water-soluble; (4) Low tinctorial power; (5) Many are unstable in the presence of heat or light; (6) Some red vegetable dyes change color in acid or alkaline solution, although some synthetic dyes will do likewise; and (7) Natural dyes are less readily available and more expensive than coal tar colors. As an advantage, odor and taste are acceptable or easily disguised.

Many coal tar colors have considerable toxicity, and lists have been prepared in various countries of prohibited and permissible food colors. In the United States, the Food and Drug Act of 1938 created three categories of certified dyes: F. D. & C. Colors (food, drugs, and cosmetics); D. & C. Colors (drugs and cosmetics); and Ext. D. & C. Colors (external drugs and cosmetics).

In Great Britain, in 1925, a "permitted" list of dyes was compiled which included the non-injurious natural dyes and five coal tar dyes. In 1951 a Food Standards Subcommittee was set up by the Ministry of Food to review the 1925 Regulations. Many of the dyes were rejected because of chronic toxicity or carcinogenicity. The remaining dyes making up the permitted list are divided into (A) Colors which, from available evidence, seem to be harmless when consumed in normal amounts, and (B) Colors for which evidence is conflicting or deficient although there is no apparent reason for them to be harmful. In the report of the Subcommittee it was made clear that the recommendations were not intended for drugs, but it is unlikely that colors not in these groups will be used for internal medications.

To simplify the myriad of names of colors, the Colour Index of the British Society of Dyers and Colourists was recently revised. This index lists each dye by reference number and includes chemical composition, synonyms and properties. Numbers in the title usually refer to the shade and the letters refer to the color (i.e. Ponceau 3R). Letters may also designate the manufacturer or a particular property of the dye.

Most coal tar dyes have the following advantages over natural colors: Precise chemical composition; dependable method of assay; water-soluble; high and reliable tinctorial power; and greater stability to pH, light, and storage conditions. However, synthetic colors also present problems in formulation, such as color change, precipitation, etc. Fading of the dye in solution may be caused by sunlight, chemical reaction, or pH.

The amount of dye required to color an aqueous solution may vary from 0.0001 to 0.1%, depending on (1) depth of color desired, (2) density of solution to be colored, (3) presence of insoluble powders, or fineness of dispersed globules. In powders, which require higher concentrations, the dye may be incorporated dry or dissolved in a volatile solvent, one in which the material being colored is practically insoluble.

Since a single dye may not give a satisfactory color, blending of dyes will produce most of the desired tints and shades. Both the 1956 *Remington* and the *N.F.X.* contain tables for blending of dyes to produce desired shades.

There is no scientific, systematic terminology for description or measurement of color in use in Great Britain at present. Emphasis is placed in this article on color in transparent rather than opaque preparations.

White light is composed of colored rays of varying wavelengths, and color is produced when an object absorbs certain of these wavelengths and reflects the rest. Color may be described visually or physically. To measure, the visual sensations caused by color may be matched with a color produced

by a standard, or by measuring the amount of light transmitted or reflected from different wavelengths within the spectrum, *i.e.* photoelectric colorimetry and spectrophotometry.

One method of visual comparison involves the use of standards in the form of a color chart. These charts take into consideration three qualities of color sensation: hue, brightness, and saturation. Disadvantages of color charts are: (1) since there are about 100,000,000 distinguishable colors, only a comparatively small number of these can be placed on one chart; (2) colors between two of the standards are difficult to define; (3) surface texture of sample and standard may differ; (4) standards are not completely permanent; and (5) new editions of standards may differ slightly from old ones.

Visual colorimeters utilize the principle that all color sensations can be reproduced by mixing suitable proportions of three colors (usually red, green, and blue), provided that none of the three can be produced by mixing the other two. Light from the sample and from a mixture of the three colors are viewed as equal parts of a clearly divided field and the intensities of the three lights in the mixture are adjusted until no difference between the halves is evident. The color of the sample can then be expressed by the formula
$S = a.R + b.G + c.B$, where a, b and c are the number of units of the stimuli R (red), G (green) and B (blue), respectively, needed to match the color of the sample S.

In subtractive colorimetry this same principle is used indirectly; the matching color is obtained by subtracting suitable wavelengths from white light by passing it through a series of red, yellow, and blue slides, each slide with an increasing depth of color and a numerical value.

Disadvantages of visual colorimetry are: (1) since individuals have differences in color perception, results may vary with two observers; and (2) results from one instrument are not directly comparable with results from other types since colors are matched in instrument units and not absolute units.

In 1931 an International Commmission on Illumination (Commission Internationale de l'Eclairage, or C.I.E.) defined the color matching characteristics of a standard observer, and recommended absolute units for color measurement. These absolute units are known as X, Y and Z and are predominately red, green, and blue respectively. Results obtained from any colorimeter using these colors can easily be converted into C.I.E. units.

A spectrophotometer uses light beams from the sample and from a white comparison surface, dispersed into spectra by passage through a prism. The quantities of light that have been reflected at each narrow band are compared either visually or photoelectrically, and a spectral relection curve is plotted. This curve is then used to calculate C.I.E. units, and to compare qualitative and quantitative differences between colors.

None of these methods, however, are well-suited to the needs of the *British Pharmacopoeia* or *Pharmaceutical Codex*. Consequently, considerable interest is shown in the system used in the *U.S.P.* and *N.F.* Providing exact scientific descriptions suitable for pharmaceutical purposes, this system is a division of the colors in the Munsell Atlas into a number of squares. Each square has been named with a hue (red, yellow, orange, etc.), and certain modifying words to indicate brightness and saturation (light, dark, weak, vivid, etc.). The resulting descriptions are easily visualized and scientifically accurate.

JOANNE BRANSON

CITATION

The Principles of Bibliographic Citation - an Informal Discourse Addressed to Writers of Scientific Papers, Fulton, John F., Internat. Rec. Med. 169:710 (Nov.) 1956.

Some of the basic principles of literary citation are discussed. The purpose of the bibliographic reference in a scientific paper is twofold: (1) it should serve to give an accurate indication of the source of a given statement and (2) it must provide a clear and concise description of the nature and scope of the printed document in which the statement is to be found.

The technique of bibliographic citation falls under two headings, journal references and references to books and official reports. Citation of references to journals or textbooks must include certain facts of importance. For journals these are authorship, title, journal and its abbreviation, date of publication, volume number, pagination, miscellaneous information. In citing textbooks the following information should be given: authorship, full title, place of publication, incorporated name of publisher, date of publication, total pagination, edition, volumes (if more than one) and pagination of each volume. In addition to these basic facts of importance, the reference citation must be consistent in capitalization, punctuation and the use of italics.

The method of bibliographic citation varies in different scientific publications and it is therefore essential, before submitting a paper for publication in a given journal, to study its bibliographic conventions closely. References cited should be alphabetized to facilitate identification. The decision of whether a bibliography should be arranged for citation by date, by number or by footnote should rest entirely upon the nature of the materials, and in particular, upon the number of citations. Although standardization of form is essential for any given paper, publishers and editors should be made to realize that there is nothing lost, but rather everything gained, if each manuscript is treated as an individual problem.

A number of abbreviated terms may be used in order to avoid repetition in a large bibliography in which names of the same author and journal occur many times. Although such terms as *Idem, Ibid., Loc. cit.*, and *op. cit.* are widely accepted and useful, sometimes they do not save much space and more frequently they are used carelessly, thus causing confusion rather than clarity. Avoiding the use of these conventions can be done in a numbered or alphabetized bibliography.

Reference should never be taken from a secondary source. But if this is not possible, this circumstance should be clearly indicated by an asterisk or in some other fashion.

CLIFTON J. LATIOLAIS

OXIDASE TEST FOR URINARY SUGAR

Evaluation of Enzyme Tests for Urinary Glucose. Jack R. Leonards, J. Am. Med. Assoc. 163:260 (Jan. 26) 1957.

Clinistix and Tes-Tape, two commercial preparations employing the enzyme glucose-oxidase, have been tested in the Department of Biochemistry at Western Reserve University School of Medicine to determine their reliability to quantitate urinary glucose.

Concentration of sugar in the urine is utilized by the clinician in regulating therapy. Concentration has been estimated by the degree of reaction using either Benedicts qualitative test or Clinitest tablets.

The product Clinistix is sold to indicate only the presence or absence of glucose, but Tes-Tape is sold with a color chart to estimate quantity.

This study was conducted due to reports by physicians that the results obtained with Tes-Tape in high concentrations of urinary sugar were not consistent. Experimentally, it was determined that Tes-Tape gave very good results in quantitating concentrations of urinary sugar below 0.25%; there was about 50% accuracy in samples containing 0.5% glucose (half of these readings were 0.25%). In samples containing 2%, 3%, and 4% glucose, results were read as 0.5% in the majority of tests.

It is pointed out that these products are excellent qualitative agents for urinary glucose; but that it is quite possible for the physician to misdirect the patient using Tes-Tape quantitative readings if the urinary sugar concentration exceeds 0.25%.

LEO F. GODLEY

HYPOANESTHESIA IN SURGERY

Use of Hypoanesthesia for Cesarean Section and Hysterectomy. Wm. S. Kroger and Sol T. DeLee, J. Am. Med. Assoc. 163:442 (Feb. 9) 1957.

[Pharmaceutically, hypnoanesthesia, holds no great interest except in the field of general information. This area of medical application being so mysteriously involved with suggestions of witchcraft and quackery, it is thought appropriate to include it here.]

This is a report of a 27 year old woman, who without pharmacologic intervention of drugs, underwent at Chicago Lying-in Hospital, a cesarean section and hysterectomy painlessly. Tests indicated that this patient would respond adequately to achieve

the necessary degree of hypnosis; and training was conducted during the last three months of gestation.

The training consisted of being hypnotized by the clinician six times, and during those sessions the patient was "schooled" in all the details of the operation. This rehearsal apparently blocks the neurophysiological pathways that transmit pain impulses.

Apparently, the thoroughness of these rehearsals during the instruction period assures the success of the program. These investigators describe hypnosis as "a state of increased susceptibility to suggestion through which motor and sensory processes are altered to initiate appropriate behavior . . .".

The patient was completely conscious and enjoyed the entire procedure and, it was pointed out, that the only time she elicited any sensation of pain was when the towel clips were being placed on the abdomen before making the skin incision. It is explained that this minor detail was inadvertantly omitted from the rehearsal.

Hypnosis can be used in only about 10% of carefully selected patients. The process can, however, be used in conjunction with chemoanesthesia in both pre- and post-operative procedures.

LEO F. GODLEY

STORAGE OF SMALLPOX VACCINE

The Heat Resistance of Dried Smallpox Vaccine, Cross, R. M.; Kaplan, C.; and McClean, D., Lancet, 1:446 (Mar. 2) 1957.

In tropical climates, ordinary glycerinated smallpox vaccine deteriorates rapidly with inadequate refrigeration and poor transportation facilities. Stable dried vaccines can withstand the exposure to tropical temperatures and will last indefinitely at domestic refrigeration temperatures. Thus, adequate reserves can be stocked for immediate control of epidemics.

The vaccine is prepared from a suspension of the virus, partially purified by phenol and differential centrifugation, in a 5% peptone solution in distilled water. The suspension is dried in a centrifugal freezer-drier and sealed under vacuum in sterile multiple-dose vials. It is dispensed with the required amount of reconstituting solution of 40% glycerin in a phosphate buffer at pH 7.2. The resulting dried vaccine is of greater purity than the ordinary vaccine, being free from bacterial contamination and tissue debris and better preserved when sealed under vacuum.

Samples of the dried vaccine were stored at -10, 37 and 45° for two years and tested at intervals. Ordinary vaccine stored at -10°C was maintained as a control throughout the experiment. Potency titrations by scarifications on rabbit skin and pock lesions on chick choric-allantoic membrane showed only a slight decrease in potency with increasing temperatures and time. The results of the tests are recorded. Despite the slight decrease in potency by laboratory titrations, the dried vaccine contained sufficient living virus for 100% successful vaccinations in human volunteers. There has been no detectable deterioration in refrigerated dried vaccine during the two year period.

NORMAN HO

current literature

. . . also calling your attention to the following articles appearing in recent hospital and pharmaceutical journals

ADMINISTRATION

—GENERAL ORGANIZATION AND ADMINISTRATION

George, Morris: What The Hospital Administrator Expects of the Hospital Pharmacist, *The Pennsylvania Pharmacist* 38:6 (Jan.) 1957.

Stuart, Eugenie M.: The Hospital Pharmacist from the Viewpoint of the Administrator, Part II, *The Hosp. Pharm.* (Canada) 10:38 (Jan.-Feb.) 1957.

Pike, Maxwell: Timetable for Establishing a Hospital Pharmacy, *Hospitals* 31:40 (Feb.) 1957.

—DISPENSING

Zugich, John J.: Errors in Medication, *Am. Profess. Pharmacist* 22:1114 (Dec.) 1956.

—PURCHASING

Dauer, Morris: The Hospital Drug Buyer, *Am. Profess. Pharmacist* 23:158 (Feb.) 1957.

AUDIT OF PHARMACEUTICAL SERVICE IN HOSPITALS

Holland, Madeline Oxford: Audit of Pharmacy in Hospitals (Editorial) *Am. Profess. Pharmacist* 23:229 (Mar.) 1957.

Anon.: Auditing Pharmacy Service, *The Pennsylvania Pharmacist* 38:10 (Jan.) 1957.

A.PH.A. AND ASHP (DIVISION OF HOSPITAL PHARMACY)

Parker, Paul F.: Division of Hospital Pharmacy, *J. Am. Pharm. Assoc., Pract. Pharm. Ed.* 18:41 (Jan.) 1957.

Parker, Paul F.: Division of Hospital Pharmacy, *J. Am. Pharm. Assoc., Pract. Pharm. Ed.* 18:102 (Feb.) 1957.

EDUCATION AND TRAINING

Zugich, John J.: Hospital Pharmacy Training Standards, *Am. Profess. Pharmacist* 23:260 (Mar.) 1957.

LAWS AND REGULATIONS

Hayt, Emanuel: Arrangements Made for Registration of Interns and Residents under Federal Narcotics Law, *Hosp. Management* 82:64 (Nov.) 1956.

Zugich, John: Hospital Pharmacy and the State Law, *Am. Profess. Pharmacist* 23:72 (Jan.) 1957.

Anon.: Hospital Men Urged to Heed, Back Pharmacy Laws, Boards, *Drug Topics* 101:36 (Jan. 7) 1957.

PARENTERAL SOLUTIONS

Otte, George E.: Why Hospital Pharmacists Should Make I.V. Solutions, *South. Hosp.* 24:82 (Sept.) 1956.

PROFESSIONAL RELATIONS

Anon.: The Pharmacists' Round Table, *Am. Profess. Pharmacist* 23:151 (Feb.) 1957.

SMALL HOSPITALS

Goulet, C. R.: The Clinical Need for Pharmacy Services in a Small Hospital, *South. Hosp.* 24:56 (Nov.) 1956.

Anon.: The Retail Pharmacist Can Serve the Small Hospital (a series of articles) *The Pennsylvania Pharmacist* 38:4 (Jan.) 1957.

Bowles, Grover C.: Nine Reasons for a Full-Time Pharmacist, *Modern Hosp.* 88:102 (Jan.) 1957.

Moravec, Daniel F.: Pharmacy Service in Smaller Hospitals, *Hosp. Management* 83:80 (Jan.) 1957.

Bowles, Grover: You Can't Afford Not to Have a Pharmacist, *Modern Hosp.* 88:106 (Feb.) 1957.

Anon.: What Size Hospital Needs a Pharmacist? *Modern Hosp.* 88:108 (Feb.) 1957.

Moravec, Daniel F.: Pharmacy Problems in the Smaller Hospital, *Hosp. Management* 83:82 (Feb.) 1957.

Anon.: No Pharmacy? Hospital Must Use Store, *American Druggist* 135:7 (Mar. 11) 1957.

Notes and Suggestions

by CLIFTON J. LATIOLAIS

HYDROCORTISONE OINTMENT BASE

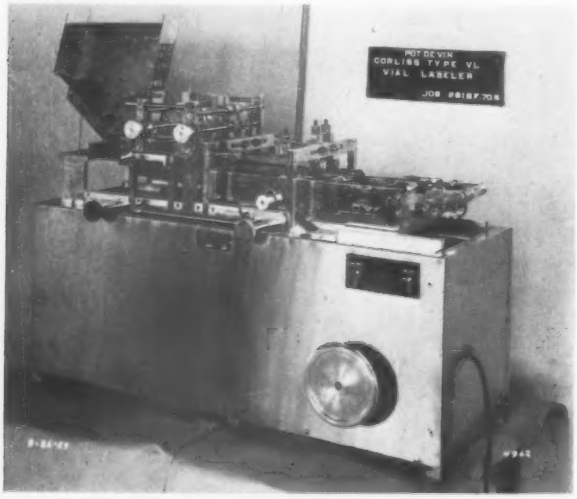
Of eleven bases evaluated as vehicles containing 1 percent hydrocortisone by Katz and Scott (*A.M.A. Arch. Dermatol. 73*:355, 1956) the following was one of five selected as generally useful. This base was characterized as not exerting too drying an effect and yet not being too greasy.

Glycerin	24.8
Cetyl Alcohol	14.9
Sesame Oil	20.0
*Polyoxyl 40 Stearate	5.0
Glyceryl Monostearate	5.0
Distilled Water, q.s.	100.0

*Myrj 52, Atlas Powder Company

AUTOMATIC LABELER AND CODER FOR VIALS AND AMPULS

The Potdevin Corlis Labeler* is used to label and code vials and ampuls automatically in one operation. The machine can label and code up to 46 vials or ampuls per minute. Labels can be either partial or full wrap-around. Special label



stock is not required; regular labels can be used. The one line coding device prints the lot number, batch number, code number, date, etc. anywhere on the label within 3/16″ from either the top or bottom. One hundred pieces of type are furnished with each unit.

The exposed working parts are either chromium plated or polished aluminum. The body of the machine is a French-grey crackle finish. The entire unit weighs 47 pounds and occupies a space of 12 x 30 inches. Installation requires only connection to an electrical outlet.

Two sizes of the machine are available. One size handles vials up to 1″ in diameter by 2″ long; the second size will handle vials from ¾″ to 1½″ in diameter and up to 5″ long. Prices range from $2,525.00 to $3,450.00 for the complete machines including coding attachments and additional size change parts.

*Potdevin Machine Company, 200 North Street, Teterboro, New Jersey

BACTERIAL SPORE TEST STRIPS

Spordex strips containing organisms for culture tests are available* for determining the efficiency of sterilization. These bacterial spore test strips are inserted in the center of packages or other material to be sterilized. Upon completion of the sterilization procedure, the test strips are removed and are then subjected to bacteriological testing to determine whether the sterilization procedure has been effective.

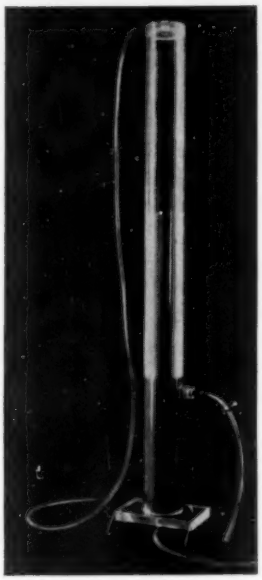
Spordex bacterial strips are available with dry spores of three individual ranges of heat resistance. These strips can be used to evaluate either moist heat or dry heat sterilization procedures.

*American Sterilizer Company, Erie, Pa.

PHARMACEUTICAL FLAVOR GUIDE

Fritzsche Brothers, Inc. has announced publication of a comprehensive, easy-to-use, 52 page reference manual on flavoring agents for use in pharmaceutical products. The Flavor Guide embraces approximately 40 pharmaceutical groupings accompanied by selected flavoring recommendations, all of which have been fully tested and proven adaptable to the type of medicinal product indicated. The Guide is fully indexed and cross-indexed for easy reference and use. Available upon request from Fritzsche Brothers, Inc., 76 Ninth Street, New York 11, New York.

DEMINERALIZER



Purification by ion-exchange to produce water with resistance of over 1,000,000 ohms per milliliter with an almost constant *p*H level of 7 is possible with the new Barnstead MM-O Mixed Bed Regenerative Demineralizer.* Cation and anion resins are thoroughly mixed in one resin bed thus permitting the ion-exchange process to take place hundreds of times as the water flows through. The manufacturer states that Model MM-O removes approximately 1100 grains per regeneration.

The unit consists of a transparent plastic column mounted on a plastic base with molded plastic fittings top and bottom. It is supplied in a complete unit with plastic tubing and distributor which aids in regenerating the resins. The base is 8″ x 8″ and height is 51″. The flow rate is from 10 to 30 gallons per hour.

*Barnstead Still and Sterilizer Company, 263 Lanesville Terrace, Boston 31, Massachusetts.

ANTI-PERSPIRANT STICK (COLOGNE TYPE)

The Reheis Company has introduced a new aluminum compound—sodium aluminum chlorhydroxy lactate complex, Chloracel—which now permits the formulation and manufacture of anti-perspirant (cologne type) sticks. Sticks prepared from Chloracel are effective antiperspirants, do not cause primary irritation and the compound is non-destructive to fabrics.

The new aluminum complex is compatible with components of the alcohol-sodium stearate gel stick. There is no reaction with the sodium soap, thus eliminating the formation of insoluble aluminum stearate which is destructive to the gel.

The company offers the following basic formula:

(a)	Sodium aluminum chlorhydroxy lactate complex, 40% solution*	50.0 Gm.
(b)	Specially denatured alcohol	42.0 ml.
(c)	Propylene glycol	3.0 Gm.
(d)	Sodium stearate	6.0 Gm.
	Perfume, sufficient quantity	

Heat (a) to 60°-65° C. Add (b) and (c) slowly with agitation, maintaining temperature of mixture. Then add (d), agitating until solution is effected. Add perfume, mix and pour into moulds.

*Available from Reheis Company, Berkeley Heights, New Jersey

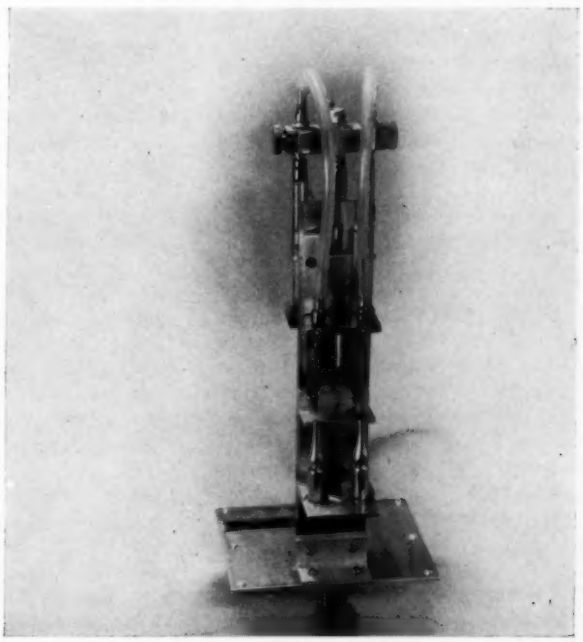
AMPUL FILLING MACHINE

The Kahlenberg Globe Machine* is used for precision filling of ampuls, vials, or other containers. It uses dual syringes, valves, and needles for filling two containers at one time. The operator merely places the ampuls in the machine, depresses the foot pedal and removes the filled ampuls to complete the filling cycle.

Guides hold the ampuls accurately centered while the needles lower into the ampuls without touching the necks. A suck-back feature removes the hanging drop from the needle tip after the fill and before the needles are withdrawn from the ampuls. The syringes are refilled as the needles withdraw, and the machine is ready to recycle immediately. The machine can be adjusted to fill one container at a time or proportional fills of two liquids can also be made.

Containers up to 5 ml. capacity can be filled two at a time; 10 ml. ampuls, one at a time; Fifty ampuls can be filled per minute using dual fill by a proficient operator. The syringes, valves, hoses and needles are removed as a unit for easy substitution or for sterilization. The current price of the ampul filler is $150.00.

*Kahlenberg-Globe Equipment Company, P. O. Box 3636, Sarasota, Florida.



ASHP affiliates

Midwest Sisters' Association

Dr. Robert Branch, Chief of Anesthesiology at St. James Hospital, Chicago Heights, presented a talk on "The Anesthetist's Viewpoint," at the February 20 meeting of the Midwest Association of Sister Pharmacists. Also included on the program was a paper on "Procedural Manuals," by Sister M. Cherubim.

The meeting was held at St. James Hospital, Chicago Heights with members and six guests present.

Rochester Area Chapter

Dr. Joseph Izzo, Associate Professor of Medicine at Strong Memorial Hospital in Rochester, was the principal speaker at the January 14 meeting of the Rochester Area Chapter of the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS. He spoke on "The Current Status of Oral Insulin Drugs (Sulfonyl Urea Compounds)."

The February 11 meeting of the Rochester Area Chapter was held at the Strong Memorial Hospital. A representative from the American Sterilizer Company spoke on the "Manufacture of Intravenous Solutions in the Hospital." This presentation concluded the special projects activity on "Sterilization," which has included a series of talks over the past year.

Greater New York Society

The regular monthly meeting of the Greater New York Chapter of the ASHP was held on February 19 at St. Clare's Hospital in New York City. The principal speaker was Dr. Fredrick Fink of Pfizer Laboratories. His discussion on "Antibiotics," was supplemented with a series of colored slides showing the steps leading to the discovery of useful antibiotics.

During the business session, the group participated in planning for the forthcoming A.Ph.A. Convention and the ASHP Annual Meeting. The Chairman of the Sister's Committee is Sister Mary Etheldreda.

Greater Kansas City Society

Members of the Society of Hospital Pharmacists of Greater Kansas City met at the Veterans Administration Hospital on January 16, 1957. President Charles Loomis reported on the Annual Institutes on Hospital Pharmacy and it was suggested that the Kansas City Group investigate the possibility of holding one of the National Institutes in Kansas City at some future year. Plans were also discussed for setting up a program for the local institute which is to be held in connection with the Midwest Hospital Convention this spring. Possible subjects for discussion include "Toxicology," and "Civil Defense." It was also suggested that a panel discussion on Pharmacy Practice in Small Hospitals be conducted.

North Carolina Society

The North Carolina Society of Hospital Pharmacists held its quarterly meeting at the Robert E. Lee Hotel, in Winston Salem on January 19. Miss Virginia Caudle, Chief Pharmacist at the City Memorial Hospital in Winston Salem, was hostess at this meeting.

A highlight of the business session was installation of officers for 1957. These included *President* Claude U. Paoloni, Cone Memorial Hospital, Greensboro; *Vice-President* Oscar J. Rodgers, Rowan Memorial Hospital, Salisbury; *Secretary* Jeanette Hunter, Cleveland County Hospital, Shelby; and *Treasurer* Wade Carter, Gaston Memorial Hospital, Gastonia.

The program consisted of discussions on "What I Expect of My Hospital Pharmacist," by Mr. Robert E. Toomey, Administrator of Greeneville General Hospital, Greeneville, South Carolina; and "What I Expect of My Administrator," by Mr. Robert Cathcart, Chief Pharmacist of The Delaware Hospital, Wilmington, Delaware.

Hospital administrators of North Carolina were invited guests of the pharmacists for this meeting. The program followed a social hour and dinner.

Association of Greater St. Louis

Members of the Hospital Pharmacists' Association of Greater St. Louis held a joint meeting with the St. Louis Branch of the American Pharmaceutical Association in January. The meeting was devoted to a discussion of antibiotic usage over the past ten years by a representative from Abbott Laboratories.

The February 11 meeting of the Hospital Pharmacists' Association of Greater St. Louis was held at St. John's Hospital with 18 members present.

Business covered included introduction of new members, a report on the work of the Committee on Special Projects by Sister Frieda and suggestions for the work of the Scholarship Committee. Also, Dr. C. L. Huyck outlined plans for the Annual Refresher Course which will be sponsored by the St. Louis College of Pharmacy on April 24.

North Dakota Society

The North Dakota Society of Hospital Pharmacists has recently organized and held the first meeting on November 17 and 18 at the North Dakota Agricultural College. Plans were made for adoption of a Constitution and By-Laws and affiliation with the national group. Officers of the North Dakota Society are *President,* John Finnie; *Vice President,* William McKechnie; *President-Elect,* William McKechnie; and *Secretary,* Sister Anne Josephine.

Included on the program for the meeting were discussions on Electrolyte Balance, Pharmacy and Administration, Pharmacy and Central Supply, Pharmacy and Nursing Service, Pharmacy and Purchasing, Tranquilizing Drugs, Vasopressors, Purchasing Techniques, and Manufacturing Bulk Compounding.

Philadelphia Hospital Pharmacists

Mr. Rudy DeCerchio and Mr. Norman Caron acted as hosts for the November 27 meeting of the Philadelphia Hospital Pharmacists' Association. The meeting was held at Our Lady of Lourdes Hospital in Camden. Following a tour of the pharmacy, the meeting was called to order and Sister Martha Mary, Directress of Nurses, extended greetings and gave a short, informal history of the hospital.

A panel presentation and discussion followed the opening address, the subject being "Outpatient Pharmacy Operations." Joseph D'Ambola, Hahnemann Hospital, spoke on "Prepackaging of Stock and Selection of Containers," Benjamin Klein, Einstein Medical Center, presented "Methods for Accepting, Processing, and Issuing Prescriptions," and Sister Mary Amelia, St. Joseph's Hospital, pointed out various aspects of "Charging for Outpatient Prescriptions."

Reports were received from numerous committees during the business session. Of particular note is the fact that the Chairman of the Membership Committee, Mr. Robert Simons, reported that 22 new members had been admitted to the Philadelphia Association since September 22. Another significant report was that presented by Mr. Joseph D'Ambola, Chairman of the Detailing Code Committee. He presented the Committee's recommendations concerning handling detail men in the hospital.

The January 15 meeting of the Philadelphia Hospital Pharmacists' Association was held at the Methodist Hospital. Pharmacists serving as hostesses included Mrs. Edith Cafaro and Miss Mary McShane. The program was devoted to a Problem Clinic with the following questions scheduled for discussion:

Does state law require special storage facilities for poisonous substances?

What schedule should be used to determine private patient price of drugs?

Can physicians prescribe narcotics for members of their immediate family and for their own personal use?

Is there a quick and convenient source of supply for infrequently prescribed vaccines, sera, and antigens?

The Philadelphia group is also sponsoring a conference on "Human Relations and Procedures for the Hospital Pharmacist." This is being conducted in cooperation with the Temple University Bureau of Industrial and Special Services. Twelve sessions are offered over a period of two and one-half months with discussions being presented under subjects such as Brain Storming, Why Get on the Hospital Team, "Getting Along" is An Art, and Bringing Out the Best in Your Associates.

Oklahoma Society

Members of the Oklahoma Society of Hospital Pharmacists met at St. Anthony Hospital, Oklahoma City, on January 17. Sister M. Teresa, President, introduced the guest speaker, Mr. Val Adams who is Vice-President of the Fox-Vliet Drug Company. Mr. Adams presented a talk on the various phases of pharmaceutical practice covering some of the trends which are taking place in the profession. He discussed research, inventory problems, and pharmaceutical education.

Mr. Paul Parker, Director of the Division of Hospital Pharmacy of the A.Ph.A. and the ASHP, was one of the principal speakers at the Annual Meeting of the Oklahoma Society of Hospital Pharmacists which was held at the Skirvin Hotel in Oklahoma City on November 8. Other speakers included E. R. Weaver, Secretary of the Oklahoma Pharmaceutical Association; Cleveland Rodgers, Executive Director of the Oklahoma Hospital Association; L. Donnell, Hospital Administrator of the Muskogee Municipal Hospital; and Dr. Charles Schwartz, Professor of Pharmaceutical Chemistry, Southwestern State College, Weatherford, Oklahoma.

New officers for the coming year were installed including *President* Sister Mary Teresa, St. Anthony Hospital, Oklahoma City; *Vice-President* Paul Pearson, Municipal Hospital, Stillwater, Oklahoma; and *Secretary-Treasurer* Wanda Lee Teakell, St. Anthony Hospital, Oklahoma City, Oklahoma.

President Paul Parker installs officers of Oklahoma Society. Left to right: Paul Pierson, Sister M. Teresa, Paul Parker, and Wanda Lee Teakell.

Southeastern Society

Officers of the Southeastern Society of Hospital Pharmacists have been announced for the 1957-1958 term. These include *President* William W. Taylor, North Carolina Memorial Hospital, Chapel Hill, North Carolina; *Vice-President* Malcolm F. Claus, Southern Baptist Hospital, New Orleans, La., and *Secretary-Treasurer* James W. Mitchener, Cabarrus Memorial Hospital, Concord, N. C.

Western Pennsylvania Society

The January meeting of the Western Pennsylvania Society of Hospital Pharmacists was devoted to the election of officers and outlining a schedule of activities for the coming year. New officers of the Western Pennsylvania Society include *President* Gerard J. Wolf, Mercy Hospital, Pittsburgh; *Vice-President* James Sandala, Western Pennsylvania Hospital, Pittsburgh; *Secretary* Natalie Certo, St. Francis General Hospital, Pittsburgh; and *Treasurer* Kathleen Hvozdovich, St. Clair Memorial Hospital, Pittsburgh.

Texas Society

The Texas Society of Hospital Pharmacists held its regular meeting at the time of the annual Hospital Pharmacy Seminar at the University of Texas, January 25-27. The Seminar is sponsored jointly by the College of Pharmacy at the University of Texas, the Extension Division and the Texas Society of Hospital Pharmacists.

The business meetings were presided over by Paul Hudson, Pharmacist at the V.A. Hospital, Houston, until the new officers were installed by Milton Skolaut, Vice-President of the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS. Mr. Skolaut

ASHP Vice-President Milton Skolaut installs officers of Texas Society. Shown left to right: Fred Borth, President; Milton Skolaut; Past President Paul Hudson; and Past Secretary Louise Pope.

who is Chief of Pharmaceutical Service at the Clinical Center, National Institutes of Health, Bethesda, was graduated from the University of Texas Pharmacy School in 1941. He was a guest speaker during the Seminar.

New officers of the Texas Society for 1957 include *President* Fred Borth, Seton Hospital, Austin; *Vice-President* James Beran, Baylor Hospital, Dallas; *Secretary* Doris Smith, Austin State School, Austin; and *Treasurer* Blanche Groos, San Antonio State Hospital, San Antonio.

President Borth appointed Mr. Robert Lantos, Director of Pharmacy Service, University of Texas Medical Branch, Galveston, to head the Committee on Program and Public Relations and Mr. Kenneth E. Tiemann, University of Texas Student Health Center, Austin, to head the Membership Committee. Mr. Cedric Jeffers, Scott and White Clinic, Temple, Texas was appointed as a representative to the Legislative Committee of the Texas Pharmaceutical Association.

The following resolution of appreciation to the Division of Hospital Pharmacy was passed at the January 27 meeting of the Texas Society of Hospital Pharmacists:

Whereas the Division of Hospital Pharmacy of the American Pharmaceutical Association and the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS has made outstanding contributions to hospital pharmacy; now therefore be it

Resolved that the Texas Society of Hospital Pharmacists express its appreciation to the Division of Hospital Pharmacy for its valued service to members and chapters of the National Society.

Northeastern New York Society

The regular monthly meeting of the Northeastern New York Society of Hospital Pharmacists was held Thursday, December 20, at the Harlequin Room, Sheraton Ten-Eyck Hotel, Albany. This meeting was attended by fifty members and guests.

A business meeting of the Northeastern New York Society of Hospital Pharmacists was held Thursday, January 17, at 8:00 P.M. at St. Peter's Hospital, Albany. The main business carried out was the revision and adoption of a revised constitution for the Chapter.

Plans were also made for holding a Pfizer Seminar in Albany on March 23. Other activities include the Annual Meeting of the ASHP which will be held in New York City in April and the installation dinner of the Northeastern New York Society which is scheduled for June.

The regular monthly meeting of the Northeastern New York Society of Hospital Pharmacists was held Saturday, January 19, at the DeWitt Clinton Hotel, Albany.

The main speaker, Jack Cooper, Ph.D., Director of Pharmacy Research and Development Division of Ciba Pharmaceutical Products, Inc., discussed "Manufacturing and Control in Hospital Pharmacy."

Illinois Society

President Gordon called the January 8 meeting to order at 8:15 P.M. at the Michael Reese Hospital. The speaker, Dr. Jerome Van Gasse, was introduced by Vice-President Lewis Cooke. Dr. Van Gasse is Medical Director of the J. B. Roerig and Company. He discussed tranquilizers using the title "Two Little Theories May Go a Long Way." His presentation on the tranquilizing drugs as they are used in psychiatric work was unusual, informative and extremely interesting.

President Gordon made an announcement regarding the current new membership drive for the National SOCIETY. He also called this group's attention to the Pharmaceutical Audit, asking the cooperation of the hospital pharmacists.

Charles Lev announced that he had copies of a list of poisonous agents found in household items. These were made available to all attending members.

Dr. Denver Vickers of the Joint Commission on Accreditation of Hospitals was the principal speaker for the February 12 meeting of the Illinois Society of Hospital Pharmacists. Dr. Vickers discussed the work of the Committee on Accreditation with particular reference to the Pharmacy Department and the general functions which the department must provide in order to receive points for accreditation. Following Dr. Vickers' presentation, there was an opportunity for questions and discussion from the floor.

Announcements were made regarding forthcoming meetings and nominations for H.A.K. Whitney Award were received. Mr. Louis Gdalman was appointed to serve on the Joint Committee on Para-medical Services of the Illinois Hospital Association. He will represent the Illinois Society of Hospital Pharmacists.

Northern California Society

Members of the Northern California Society of Hospital Pharmacists met on December 11 at the Owens-Illinois Glass Plant in Oakland. Mr. Harold Powers of the Owens-Illinois Company, introduced Mr. James Sherbourne, Plant Service Engineer, who spoke about the operations in the Oakland Plant. Also, a film entitled "Glasstown USA," preceded the tour. Guides took the group throughout the plant

in such a way as to give the visitors an insight into every phase of glass production and packaging. Following the tour, the group enjoyed a buffet and had an opportunity to look over various displays.

During the business session which was presided over by Mrs. Marie B. Kuck, reports were received and Mr. Francis Spinelli, Chairman of the Ballot Committee, announced the new officers for 1957. These include *President* Eric Owyang; *Vice-President* Mathilde Herby; *Secretary* Jessie Lavender; and *Treasurer* Mary Locke.

The January 8 meeting of the Northern California Society was held at the University of California Medical Center in San Francisco. Preceding the regular business meeting, a film entitled "Going Our Way," was presented by Mr. George McPhee on behalf of Parke, Davis and Company.

Following the installation of new officers and the final report presented by President Marie Kuck, the new President, Mr. Eric Owyang, addressed the group and announced appointments for the coming year. These include the following: *Constitution and By-Laws*—William Dudley; *Personnel*—Ed Chilgren; *Membership*—Molly Chin; *Legislation*—Francis Spinelli; and *Program*—Al Seubert.

The publication of the Northern California Society, *Hospital Pharmacy News* will be edited by Mr. Ed Thompson and Charles Jackson.

Toledo Society

The Toledo Society of Hospital Pharmacists met at Mercy Hospital in Toledo on January 10. Guests included Mr. George Phillips, Assistant Chief Pharmacist at the University Hospital, Ann Arbor, Michigan, along with the interns in hospital pharmacy. New officers of the Toledo Society include *President* Theodorsia Tucker; *Vice-President* Barbara Lardinais; and *Secretary-Treasurer* Romayne Watson.

Alabama Society

The Alabama Society of Hospital Pharmacists met in Birmingham at the Tutwiler Hotel on October 6 and 7. Principal speakers included Dr. Frank Schabel who discussed "The Rational Chemotherapy of Virus Disease and Neoplastic Disease," and Dr. Leon Smelo who discussed "Sulfonamide Hypoglycemic Agents in Treatment of Diabetes." Also, Dr. W. D. King of Birmingham spoke on "Tranquilizers."

The Sunday morning session was devoted to reports on the various institutes and conventions held during the past year and a workshop period during which problems were discussed.

During the business session, the following new officers were elected for the coming year. *President* Mary Lancaster; *Vice-President* Mrs. Lillie Baldone; and *Secretary-Treasurer* Ed Whidden.

Colorado Society

A new group of hospital pharmacists has recently been organized in Denver, Colorado. The president is Mr. Sam Kohan of the City and County of Denver Department of Health and Hospitals. Other officers include *Vice-President* Ellsworth West, and *Secretary-Treasurer* Margaret Gaasch.

Maryland Association

The December meeting of the Maryland Association of Hospital Pharmacists was held on December 1, at Bon Secours Hospital, Baltimore, Maryland, with thirty-five members and guests in attendance.

The highlight of the meeting was a discussion by Dr. Dexter L. Reimann a former pharmacist and presently the Pathologist at Bon Secours. His topic was "The Recognition of Neoplasms of the Face." Dr. Reimann's discussion, which was supplemented by color slides, emphasized the importance of directing patients with seemingly insignificant skin lesions to adequate medical care.

A brief business meeting was held at which time the President, William H. Briner, announced committee appointments.

Refreshments were furnished and served by the members from Bon Secours.

Florida Society

The Florida Society of Hospital Pharmacists met in conjunction with the Florida Hospital Association in Jacksonville on November 29 and 30. The sessions were presided over by President Mary Wernersbach, Chief Pharmacist at the Mount Sinai Hospital in Miami Beach. Papers presented included the following:

"The Five Year Pharmacy Program of the University of Florida," by Mr. Charles S. Haupt, Associate Director of the Bureau of Professional Relations, College of Pharmacy, Gainesville.

"Narcotic Regulations in Hospitals," by Mr. Frank Castor, Director of the Bureau of Narcotics of the Florida Public Health Service.

"Pharmacy Etiquette," by Mr. Allen Ford, Chief Pharmacist at Baptist Memorial Hospital, Jacksonville.

"What the Pharmacist Should Know About Blue Cross," by Mr. Jack Andes of the Florida Blue Cross Hospital Service.

Included also on the program was a round table discussion during which time the following subjects were covered: Pharmacy Service During the Night Hours, Telephone Courtesy, Pricing Schedules, and Economic Factors Affecting the Pharmacist.

President Wernersbach appointed an Information Representative for each of the three districts of the state. These include Mr. Carl Dell, Director of Pharmacy Service, Jackson Memorial Hospital, Miami; Mr. John Mahrt, Chief Pharmacist, Orange Memorial Hospital, Orlando; and Mr. Allen Ford, Baptist Memorial Hospital, Jacksonville.

The program chairman for the coming meeting which will be held in Miami Beach is Mr. Charles Haupt.

Mr. Dwight Ferguson, Chief Pharmacist at the Veterans Administration Hospital in Bay Pines, was elected the new President of the Florida Society.

Southern California Society

The Southern California Society of Hospital Pharmacists opened the new year with a dinner meeting honoring the newly elected officers on January 10. The principal speaker was Mr. Eugene M. Elson, Chief Legal Counsel for the California Pharmaceutical Association. "Behind the Scenes in Pharmacy Legislation," was the topic discussed.

Jack Heard, the newly elected President was installed in office. Mr. Heard was formerly president of

the Northern California Society. At present he is Chief of the Pharmacy Department, University of California at Los Angeles, which provides pharmacy services for the newly constructed hospital, including a medical school, nursing school and outpatient service for the University.

Ernest C. Kelso of the Lincoln Receiving Hospital is the Vice-President.

Also installed were Arthur Rosen, of the Los Angeles County General Hospital as Treasurer and Melvin B. Schwartz of the newly constructed Mt. Sinai Hospital as Secretary.

More than a hundred members and their guests attended and enthusiastically launched what is expected to be a very successful year.

The February meeting of the Southern California Society of Hospital Pharmacists was held at St. Vincent's Hospital on February 13, with all officers in attendance. Jack Heard, President, called the meeting to order before the 68 assembled members and their guests.

Mrs. Laura H. Taylor, Chief Pharmacist of St. Vincent's was introduced and proceeded with her portion of the program. Miss Kikuyo Munemori, staff pharmacist, gave an interesting talk on the 101 year history of the institution and described in detail the functioning of her department.

High point of the evening was the color movie travelog presented in professional commentary style by Dr. Clarence J. Albaugh, leading Los Angeles ophthalmologist and member of the St. Vincent staff. Assisting him was his sister, Dr. Kathryn L. Albaugh, also an ophthalmologist and accomplished movie photographer. The films covered a recent visit to the Far East, principally Hong Kong and the Phillipines, and proved instructive as well as entertaining.

Charles Towne gave a resume of projects being carried out by students of U.S.C. and pharmacy residents at the Veterans Hospital. As an example of the work being done, he introduced Mr. Alton Warren, a pharmacy resident at the Veterans Hospital. Mr. Alton presented a paper on the use of an electric typewriter employing roll labels for prescription writing. His findings, after a trial period of some months, are that a neater, more legible label results presenting a uniform appearance. A reduction in the amount of time required for typing also was found. Mr. Alton reported an estimated savings of $900 per machine in salary expense.

A general discussion on prescription writing and standardization of abbreviations followed.

Joint Meeting of the Indianapolis Branch of the A.Ph.A. and the Indiana Chapter of the ASHP, January 12, 1957.

Rochester Area Chapter

The Rochester Area Chapter of the ASHP held a joint meeting with the Western New York (Buffalo) Chapter on December 8. The guest speaker was Dr. Christopher Parnall, Administrator of the Rochester General Hospital. His topic was "Hospitals Today and the Pharmacists' Place in Them."

Massachusetts Society

Members of the Massachusetts Society of Hospital Pharmacists heard Dr. Thomas C. Fleming, Product Development Manager at Hoffmann La Roche, speak at the January 16 meeting. The group met at the Hotel Somerset in Boston.

During the business session President Charles Schraub encouraged the members to cooperate in the "Audit of Pharmaceutical Service in Hospitals." Other business transacted included a change in the Constitution and By-Laws, appointment of committees, and a discussion concerned with cooperation with retail pharmacists and the state board of registration.

Arizona Society

The January meeting of the Arizona Society of Hospital Pharmacists was held on the afternoon of January 20 at the Memorial Hospital in Phoenix. Plans for future meetings were outlined and committee appointments announced.

The program included movies on "Varidase," and on "Diamox."

Members of the Arizona Society of Hospital Pharmacists met at the Pima County Hospital in Tucson on February 17. During the business meeting a report was received from the Chairman of the Commitee on Special Projects and plans were considered for participation in the Annual Convention of the Arizona Hospital Association.

The program included movies on Problems of Old Age and on Butazolidin.

Western New York Chapter

Members of the Western New York Chapter of the ASHP were guests at a luncheon held at the University of Buffalo School of Pharmacy on February 18. During the meeting Mr. Herbert Reiman reported on a panel discussion on "The Hospital Formulary," which was held at the Western New York Hospital Administrators Association. The panel consisted of Dr. Clifton Lord, Professor of Hospital Pharmacy of the University of Buffalo School of Pharmacy, *Moderator;* Dr. Robert O. Bauer, M.D., Chairman of the Pharmacy Therapeutics Committee, Roswell Park Memorial Institute; Mr. Herbert Reiman, Assistant Chief Pharmacist, Mercy Hospital, Buffalo, New York; and Mr. Arthur A. Lepinot, Administrator, Roswell Park Memorial Institute, Buffalo, New York.

At the Conclusion of the Luncheon Dr. Nicholas Hansl spoke to the group on "Arteriosclerosis and Atherscleros is."

as the president sees it

PAUL PARKER

American Pharmaceutical Association, Washington, D. C.

This has been a very interesting year for your president. The opportunity to meet with many of the affiliated chapters and to visit with a number of our members in their own hospitals has given a much broader concept of the practice of hospital pharmacy on a national scale. It has also provided contacts, both personally and organizationally, which will be valuable in directing the Division of Hospital Pharmacy.

It is impossible to sufficiently express my appreciation to all the groups and individuals that have been so hospitable. The visit to each area was a unique experience. A summary of the extent of activity includes the Catholic Hospital Association Institute in Milwaukee; American Hospital Association Institute in Austin, Texas; Houston Area Society meeting; A.H.A. Institute in Chicago; A.H.A. Convention in Chicago; Maryland Association meeting in Baltimore (Pfizer Seminar); joint meeting of the Southeastern New York Society and New York Branch of the A.Ph.A.; Western New York Chapter meeting in Buffalo (Pfizer Seminar) and a testimonial dinner for Ben Teplitsky by the Northeastern New York group in Albany.

A thirty day trip to the West Coast included Northern California Chapter Seminar in San Francisco; joint meeting of the Washington State group and the Puget Sound Branch of the A.Ph.A. in Seattle; Oregon Society meeting in Portland; Utah Society meeting in Salt Lake City; Arizona Society Meeting in Phoenix; San Diego Society meeting and also a meeting of the Southern California Society in Los Angeles. The trip also included a meeting to organize the Colorado Society in Denver; Greater Kansas City Area Society and a meeting with Mr. Dan Moravec and president-elect of the A.Ph.A., Dean Burt, in Lincoln, Nebraska. Next to the Greater St. Louis Society and a visit at the headquarters of the Catholic Hospital Association and on to the convention of the Oklahoma Hospital Association and a meeting of the Oklahoma Society in Oklahoma City.

Back to Washington, D. C. for the mid-year meeting of the House of Delegates of the A.Ph.A. and an Executive Committee meeting of the A.S.H.P. Then to the convention of the Virginia Hospital Association in Roanoke and later a meeting of the Joint Committee of the A.H.A. and A.S.H.P. in Washington. Next was the American Association for the Advancement of Science in New York to conclude the 1956 calendar year.

Return trips were made to Seattle and Chicago to plan the forthcoming Institutes and to New York to make plans for the Annual Meeting. Also met with the Virginia Society in Richmond and the Maryland Society in Balitmore. With the exception of a couple of trips to New York and Philadelphia, this summarizes the year's travels.

It is impossible to summarize the benefits and ideas that have been gained from this extensive itinerary, but one fact is evident. Widespread implementation of improvements in pharmaceutical services can only be made at the local level.

A most important part of the A.S.H.P. activities for the year will be summarized in the reports of the various committees during the forthcoming Annual Meeting. These reports will be mimeographed and distributed to the delegates at the meeting of the House of Delegates and later published in the proceedings section of THE BULLETIN. We hope that the affiliated chapters will consider these reports individually and either attempt the implementation of their recommendations or submit constructive criticism to the succeeding committees.

I would like to extend my sincere appreciation to every member of the SOCIETY for your support of the A.S.H.P. during the past year. To the other officers, members of the Executive Committee, officers of the affiliated chapters, members of our committees, and others who have contributed their time and efforts, may I extend my very special—thanks.

Paul F. Parker

NEWS

1957 Whitney Lecture Award

Sister Mary John, R.S.M.

Sister Mary John, R.S.M., Chief Pharmacist at Mercy Hospital in Toledo, Ohio, has been named as the 1957 recipient of the H.A.K. Whitney Lecture Award. The Award, established in honor of the first Chairman of the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS, is presented annually by the Michigan Society of Hospital Pharmacists to an individual who has made outstanding contributions in the field of hospital pharmacy.

The 1957 Award is being presented in conjunction with the ASHP Annual Meeting which is being held at Hotel Statler in New York City, April 28-30. The Award Dinner is scheduled for Monday night, April 29 at Hotel Statler. At that time members of the SOCIETY and leaders from allied hospital and pharmaceutical groups will pay tribute to Sister Mary John and Mr. H.A.K. Whitney.

Sister Mary John has been Chief Pharmacist at Mercy Hospital for seventeen years. She is a Charter member of the ASHP and has been a leader in the group since its organization in 1942. Sister Mary John served as treasurer and a member of the Executive Committee of the national organization from 1943 until 1946. In addition to being a registered pharmacist, she is a nurse and an anesthetist. She served as a U.S. Army Nurse in France during World War I.

Past recipients of the Harvey A. K. Whitney Award include W. Arthur Purdum, Hans S. Hansen, Edward Spease, Don E. Francke, Evlyn Gray Scott, Gloria N. Francke, and George F. Archambault.

National Pharmacy Week Winners—Hospital Pharmacy

Hospital pharmacists winning awards in the 1956 National Pharmacy Week Display Contest included Mr. Charles J. Keller, Hackensack Hospital Association, Hackensack, New Jersey, who won first prize which consists of a plaque. The second prize, consisting of a certificate of merit was won by Sister Mary Oswalda, St. Joseph's Children's and Maternity Hospital, Scranton, Pennsylvania. The third prize, which also includes a certificate of merit, was awarded to Sister M. Gracia Ebenger, St. Clara's Hospital, Lincoln, Illinois.

According to the announcement from the Committee on Public Relations of the American Pharmaceutical Association, participation in the 1956 observance of National Pharmacy Week by individual pharmacists and pharmaceutical associations marked new highs in all areas of activity. This annual project, sponsored by the A.Ph.A., is the most consistently successful and effective public relations program in American Pharmacy. The 1956 event marked the 30th formal observance of National Pharmacy Week.

Recipients of Research Grants Announced

Six hospital pharmacists have received funds for research under a ten thousand dollar grant made available to the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS by Lederle Laboratories, Division of American Cyanamid Company. Funds from this grant are allocated for research for the improvement of hospital pharmacy services and for the formulation and development of pharmaceuticals prepared in hospital pharmacies.

According to Mr. Paul Parker, President of the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS, those receiving grants are John W. Webb and Anthony N. Ciampa, Massachusetts General Hospital, Boston, Mass.; Don E. Francke, University Hospital, Ann Arbor, Mich.; Joseph H. Beckerman, University of California Hospital, Los Angeles, Calif.; Herbert L. Flack, Jefferson Medical College Hospital, Philadelphia, Pa.; and Alex Berman, University of Michigan College of Pharmacy, Ann Arbor, Michigan.

Administration of the program and selection of projects to receive support from this grant are handled through the SOCIETY's Committee on Research and Development, headed by Mr. Milton Skolaut, Chief, Pharmaceutical Service,

Clinical Center, National Institutes of Health, Bethesda, Md. The board of selection is composed of persons thoroughly familiar with hospital pharmacy practices and hospital pharmacy education.

It is anticipated that the present program will be expanded with additional funds available in future years. Applications for grants for research in hospital pharmacy are available from Mr. Paul Parker, AMERICAN SOCIETY OF HOSPITAL PHARMACISTS, 2215 Constitution Avenue, N.W., Washington 7, D. C.

Weidle Receives Lascoff Award

Leroy A. Weidle, Sr. of St. Louis, Missouri has been named as the 1957 recipient of the American College of Apothecaries J. Leon Lascoff Memorial Award. A practicing pharmacist, Mr. Weidle is currently the President of C. F. Knight Drug Company which operates five prescription pharmacies in St. Louis.

As one of the organizers, Past Presidents and Directors of the American College of Apothecaries he has been one of the motivating forces for the growth and success of the organization. His many contributions to the field of pharmacy include lectures to various pharmacy student groups as well as participation as an instructor in numerous refresher courses for practicing pharmacists.

Well known in pharmaceutical circles Mr. Weidle is currently Vice-President-Elect of the American Pharmaceutical Association, a member of the St. Louis Retail Druggist Association and the National Association of Retail Druggists.

Mr. Weidler has been active in many civic affairs and is currently a member of the Board of the American Cancer Society and the Missouri Social Hygiene Association. Recently he was honored by being presented the "Alumni Association Award" from the St. Louis College of Pharmacy and Allied Sciences. He is an active member of Rotary and other fraternal organizations.

The award will be presented at the Annual banquet of the American College of Apothecaries in conjunction with their convention in New York City at the Hotel Statler on Monday evening, April 29th, 1957.

Other recipients of the J. Leon Lascoff Memorial Award have included, Sister Jeanette, Charles V. Selby, Dr. Perry A. Foote, Dr. Don Francke, Dr. Robert L. Swain, Dr. George Urdang, Dr. Robert P. Fischelis, Leslie M. Ohmart, Max N. Lemberger and John B. Heinz.

A.S.H.P. Membership Pin

During the past few months every member of the SOCIETY has received a pin or lapel button which may be worn to signify that he or she is a member of the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS. Adapted from the official insignia of the SOCIETY, the pin consists of a sterling silver mortar and pestle centered on a green enamel cross outlined with silver with the initials "A.S.H.P." at the points of the cross.

The pins have been made available through McKesson and Robbins, Inc. and will be distributed on a continuing basis as new members join the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS.

On presenting the pin to each member of the SOCIETY, the following statement is made on a card enclosed with the pin.

> *When you wear the enclosed insignia, it will indicate to the public, your friends, and to your associates in the health services that you are a member of the American Society of Hospital Pharmacists. By approving of the objectives of this Society, you have agreed to cooperate with your fellow members "(a) to provide the benefits and protection of a hospital pharmacist to the patient, to the institution which he serves, to the members of the allied health professions with whom he is associated, and to the profession of pharmacy, which they will receive through the skill and art of qualified hospital pharmacists; (b) to improve the qualifications and usefulness of hospital pharmacists through high standards of professional ethics, education, and attainments; (c) to assist in providing for a future adequate supply of such qualified hospital pharmacists; (d) to promote research in hospital pharmacy practices and in pharmaceutical problems in general; (e) to increase the dissemination of pharmaceutical knowledge by providing for interchange of information."*
>
> *This pin has been provided through the courtesy of McKesson and Robbins, Inc. The Society is pleased to cooperate in making it available to its members, and we hope that you will take pride in wearing it.*

Hydrocortisone Preparations Available on Prescription Only

The Food and Drug Administration has recently published an order denying proposals to permit sale without prescription of ointments and lotions containing hydrocortisone and hydrocortisone acetate. Such products are prescribed for relief of various skin disorders.

The ruling, published in the Federal Register, summarizes the evidence for and against the proposal as well as the Food and Drug Commissioner's findings and order.

According to the Commissioner's statement, the available evidence fails to show that these drugs are safe for use without medical supervision. In particular, there is insufficient evidence to show the range in the amount of hydrocortisone that is absorbed through the skin and the clinical significance of such absorption:

Ten pharmaceutical firms had petitioned FDA to exempt the drugs from the prescription dispensing requirement. A proposed order to this effect was published in the Federal Register on January 20, 1956. It was challenged by members of the medical and pharmaceutical professions and a public hearing was called to receive further evidence. Based on testimony from dermatologists, the Food and Drug Administration reversed its proposed decision. The present order, however, does not prejudice the right of petitioners to renew their proposal and present further scientific data.

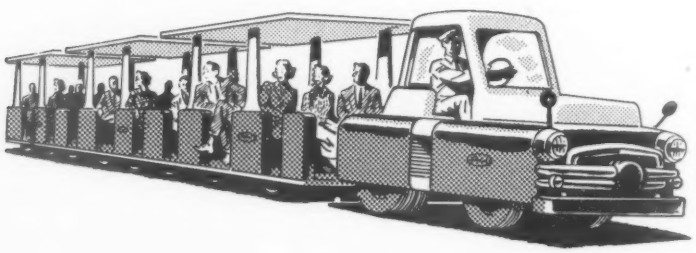
Tenth International Hospital Congress

The Tenth International Hospital Congress which is organized by the International Hospital Federation, will be held in Lisbon, Portugal from June 3 to 7 according to an announcement by the Chairman of the Congress and President of the Federation, Mr. Luigi Colombo. The headquarters of the Congress will be at the Hospital de Santa Maria which is one of the most modern teaching hospitals in Europe. The theme will be "International Cooperation for Hospital Development—The Hospital of the Future."

The program will consist of a number of lectures and study sessions which will be simultaneously translated in English, French, and Portuguese.

Participation is open to all persons interested in hospital and health services, regardless of membership in the International Hospital Federation. Correspondence relative to attendance should be directed to Capt. J. E. Stone, C.B.E., M.C., F.S.

When you're at the APhA Convention



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A.A., Honorary Secretary and Treasurer, International Hospital Federation, 10 Old Jewry, London, E.C.2, England.

American Sterilizer Company

The American Sterilizer Company, Erie, Pa., has purchased Hospital Liquids, Inc., Milledgeville, Georgia, 22-year-old supplier of parenteral solutions for hospitals. Production will be continued under the new corporate name of Amsco Hospital Liquids, Inc.

Sales and service to hospitals in the Atlanta, Georgia area will be handled through the American Sterilizer district office at 1297 Spring Street, N.W. Sales elsewhere in the United States will be continued through the regularly established Hospital Liquids sales organization.

Howard M. Fish, President of American Sterilizer, will be President of the new company; Robert L. Boyd, also of Amsco, has been named Vice-President and General Manager of the new subsidiary and John Shaw, president of the former company, will continue as Vice-President in charge of Production for the new corporation. Sheldon Page was elected Secretary-Treasurer.

World Health Day

The United States is joining with other nations in the observance of World Health Day, April 7, Dr. Leroy E. Burney, Surgeon General of the Public Health Service, announced recently.

Federal agencies this year will observe the theme, "Food and Health," in programs dealing with nutrition, food production and distribution, and food protection and sanitation, Dr. Burney said. The theme will also be used to recruit young Americans for careers in nutritional and other food and health programs. Agencies participating include the Department of Health, Education, and Welfare, the Department of Agriculture, and the Department of State.

In cooperation with the National Citizens Committee for the World Health Organization, the government committee for World Health Day will also meet requests for material from industries and voluntary groups that plan to observe the day. Special kits of material will be prepared for this purpose. Dr. H. van Zile Hyde, chief of the Public Health Service's Division of International Health, is chairman of the interagency Committee.

The World Health Day theme was selected by the World Health Organization, Dr. Hyde explained, to commemorate the anniversary of the adoption of the Constitution of the World Health Organization. A different theme is chosen each year to encourage coun-

on duty in the emergency room

Albumin/ CUTTER

for rapid shock therapy

Albumin should be available for emergency treatment following trauma, hemorrhage or burns because it immediately restores and maintains an effective blood volume. An intravenous infusion of 50 cc. of 25% albumin may be expected to pull 175 cc. of fluid into the circulatory system *within 15 minutes.* It would require 250 cc. of plasma or 500 cc. of whole blood to duplicate this therapeutic effect. In addition, Albumin/Cutter is salt-poor, heat-treated against the hepatitus virus, and ready for immediate use. Also indicated in: acute barbiturate poisoning, cirrhosis, cerebral edema, nephrotic syndrome, hypoproteinemia.
Available in: 50 cc. emergency kits, complete with administration equipment; 20 cc. vials.

Make sure your supply of Albumin/Cutter is ample for emergencies as well as for routine hospital administraton.

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BERKELEY, CALIFORNIA

Looking for help in setting up standard disinfection procedures?

Send for these six handy cards on how to use **Amphyl®** *throughout the hospital*

At all personnel levels,
simple instructions on these easy-to-read cards encourage quicker understanding and acceptance of standard methods of disinfection.

Use of Amphyl can effect savings in both labor and materials as it disinfects, deodorizes, and helps clean in one operation. The small amount necessary for effective bactericidal, fungicidal, *and tuberculocidal action*, and its unvarying stability even in dilution, can lower costs even further when Amphyl is standard for every disinfection need.

Recommended procedures are based on actual hospital experience. Planned for personnel training and bulletin boards.

How many of each card would you like? Check this list.

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tries to improve various types of health programs. Because the emphasis this year is on food, another United Nation's agency, the Food and Agriculture Organization, is co-sponsor of the Day.

Themes of previous years which have been widely used by governmental groups, industries and voluntary organizations throughout the U. S. are: "Destroy Disease Carrying Insects" (1956), "Clean Water Means Better Health" (1955), and "Health is Wealth" (1954).

V. A. Residencies in Hospital Pharmacy

The United States Civil Service Commission has announced that applications are being accepted for Residencies in Hospital Pharmacy for duty in Veterans Administration hospitals and centers in various cities throughout the United States.

The residency is twenty-two months in length and consists of part-time work in hospital and out-patient pharmacy and graduate study in pharmacy at a cooperating university. Residents receive $2.18 an hour and are employed approximately 28 hours a week. Applicants must have completed a 4-year course in pharmacy and have a bachelor's degree. They must be currently registered as a pharmacist.

The positions to be filled from this examination are located in the Veterans' Administration Center, Los Angeles, California; Veterans' Hospital, Buffalo, New York; Veterans Administration Hospital, St. Louis, Missouri; Veterans Administration Hospital, Iowa City, Iowa; and such others as may from time to time be added.

Further information and application forms may be obtained at many post offices throughout the country, or from the United States Civil Service Commission, Washington 25, D. C. For residencies beginning September 1, 1957, applicants should file their applications with the Central Board of U. S. Civil Service Examiners, Veterans Administration, Washington 25, D. C., not later than May 1, 1957.

Internship Programs Announced

The University of California Hospital at Los Angeles now offers an internship program in hospital pharmacy in cooperation with the academic program at the University of California School of Pharmacy, leading to a Master's Degree in hospital pharmacy. The internship begins September 1st and may take from one to two years to complete the requirements. The intern is rotated through all phases of the department. The stipend, including allowances, is $160 monthly. A Pfizer scholarship of $75 monthly is also available. For further information write Mr. Jack S. Heard, Chief Pharmacist, University of California Hospital, Los Angeles 24, California.

The Orange County General Hospital, Orange, California, has announced a Two Year Residency in Hospital Pharmacy. Applications are now being accepted from pharmacists interested in advancing their training for an attractive career

in hospital pharmacy by the Orange County General Hospital. This progressive hospital, soon to have a 1200 bed capacity, is offering a two year residency in cooperation with the University of California, where the resident will complete work for a degree, Master of Science in Pharmacy.

The candidate must be a graduate of an accredited College of Pharmacy, hold a B.S. Degree in Pharmacy, be licensed in the State of California, or be eligible to take the California State Board of Pharmacy examination.

The salary is $337.00 per month the first year, and $355 per month the second year.

All interested persons should write the Orange General Hospital, Orange, California, for further information.

THE JOHNS HOPKINS HOSPITAL, in cooperation with the Graduate School and the School of Pharmacy of the UNIVERSITY OF MARYLAND, announces that internships in Pharmacy are open to a limited number of 1957 graduates of recognized schools of pharmacy. Appointments are for a period of twenty-two months beginning September 1, 1957. During twenty months interns devote one-half time to hospital pharmacy training and one-half to graduate study. Full-time training in the hospital pharmacy is required for two months during the summer of 1958. Four weeks of vacation are allowed during the term of appointment. Upon satisfactory completion of the internship and the course of study, Master of Science degrees are conferred by the University of Maryland and Certificates of Internship are awarded by The Johns Hopkins Hospital.

A stipend of $200.00 per month is provided by the hospital. The University of Maryland makes a reduction of 25 percent in tuition fees. The full graduate tuition is $10.00 per semester hour and thirty semester hours of work are required for the Master's degree. In addition, there is a $10.00 matriculation fee and a $10.00 diploma fee. Complete information regarding curricula appears in the catalogue of the School of Pharmacy, a copy of which may be secured by sending a request to the School of Pharmacy, University of Maryland, 32 South Greene Street, Baltimore 1, Maryland.

Opportunity is offered for well-rounded practical experience in hospital pharmacy administration, pharmaceutical manufacturing, prescription compounding, dispensing, and in the preparation of sterile solutions and other sterile products. The facilities of the Welch Medical Library of The Johns Hopkins University and the libraries of the University of Maryland are available. Off duty hours are so arranged that one intern is on call to take care of emergency orders when the hospital pharmacy is closed.

Interns may live at the hospital, or if they prefer, they may rent nearby rooms or apartments. Rooms in the hospital residences rent for $25.00 per month. Meals may be purchased for a nominal sum in the hospital dining rooms.

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Dosage: 2 cc. daily.

Each 2 cc. dose contains:

Thiamine HCl (B_1)	10 mg.
Riboflavin (B_2)	10 mg.
Niacinamide	50 mg.
Pyridoxine HCl (B_6)	5 mg.
Sodium Pantothenate	10 mg.
Ascorbic Acid (C)	300 mg.
Vitamin B_{12}	15 mcgm.
Folic Acid	3 mg.

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Regulations regarding the personal conduct and habits are those established by the Director of the Hospital for interns on other hospital services.

There is no formal application blank under this program but applicants must submit a statement giving full details as to the date and place of birth, citizenship, health, marital status, education and pharmaceutical experience together with a small recent photograph. An official transcript of the applicant's college record is required. The applicant should ask the dean and two other members of the faculty of his college to write to the Director giving their estimates of the applicant's personality and fitness.

Letters of application and other required information should be forwarded to Russell A. Nelson, M.D., Director, The Johns Hopkins Hospital, Baltimore 5, Maryland, not later than April 1, and appointments will be announced on or before May 15, 1957.

Career Booklet Available

"Shall I Study Pharmacy," third edition of authoritative career brochure of the American Association of Colleges of Pharmacy, is now available.

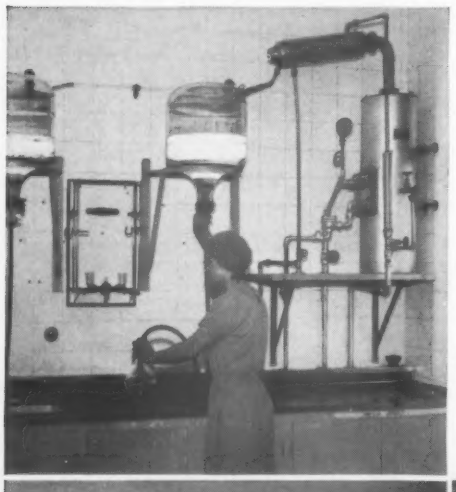
Professor R. A. Deno, Chairman of the AACP Committee on Recruitment Aids, recently summarized developments in recruitment for pharmacy for the Directors of the American Foundation for Pharmaceutical Education. The Foundation is co-sponsor of a number of recruitment aids made available since the fall of 1953.

150,000 copies of "Shall I Study Pharmacy" have been sent to teachers, counsellors, and students in high schools throughout the country.

More than 250,000 smaller brochures, reprints of addresses on careers in pharmacy by W. Paul Briggs, Secretary of the Foundation, have been distributed through cooperation of McKesson and Robbins, Incorporated and the National Association of Chain Drug Stores.

And more than 800,000 copies of the New York Life Insurance Company reprint of an interview with Dr. Briggs, "Should You be a Pharmacist" have been distributed. This interview first appeared as an advertisement in three popular nationally distributed magazines.

Two career films "Design for Life" and "Time for Tomorrow" have been shown in high schools



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Barnstead Stills are also available in still and tank combinations, with manual and full automatic controls, accessories, and in series for Double and Triple Distillation.

and on television since last fall to audiences estimated at 50,000 and at 5,000,000 respectively.

A "Pharmacy-Study Portfolio" of eight recruitment aids and with suggestions for use by practicing pharmacists is the latest addition to releases of the College Association and the Foundaiton.

Dr. Deno stated that these two organizations have spent over $125,000 on this program during the past three years plus, and estimated an equal or larger sum had been devoted by others to ancillary projects during this period.

More than a quarter million dollars, then, has recently been devoted to quality recruitment for pharmacy. The program is being vigorously continued, and merits complete support from all segments of pharmacy—most especially from the practicing pharmacist.

Information on sources of the several recruitment aids is available from the Secretary of the AACP: Dr. G. L. Webster, College of Pharmacy, University of Illinois, 833 S. Wood Street, Chicago 12, Illinois.

calendar of meetings 1957

New England Hospital Council (including New England Council of Hospital Pharmacists)—March 25-27, Boston, Massachusetts. (Statler Hotel)

Midwest Hospital Association (includes Hospital Pharmacy Section)—April 24-26, Kansas City, Missouri. (Municipal Auditorium)

Southeastern Hospital Conference (includes Southeastern Society of Hospital Pharmacists)—April 24-26, Atlanta, Georgia. (Atlanta-Biltmore Hotel)

Pre-Convention Conference on Parenteral Products (conducted by the Philadelphia Hospital Pharmacists' Association)—April 27, New York City. (Hotel Statler)

American Pharmaceutical Association—April 28-May 3, New York City. (Hotel Statler)

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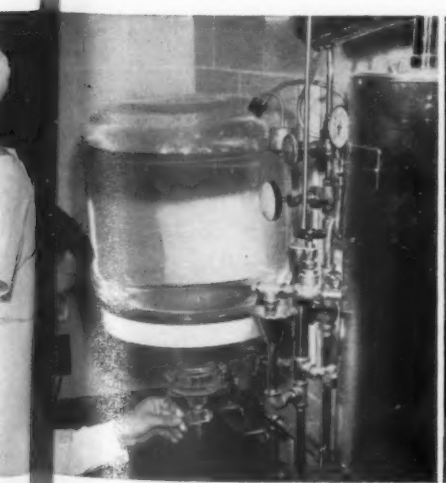

Lee Memorial Hospital Fort Meyers, Florida	St. Olaf Hospital Austin, Minnesota
Cross County Hospital Yonkers, New York	St. Margaret's Hospital Montgomery, Alabama
Barr Hospital Ukiah, California	Notre Dame Hospital Lynch, Kentucky
St. Agnes' Hospital Fond Du Lac, Wisconsin	Lockport City Hospital Lockport, New York
Winter Haven Hospital Winter Haven, Florida	Holy Cross Hospital Salt Lake City, Utah
Bedford Health Center Brooklyn, New York	Crossett Health Center Crossett, Arkansas
Girard General Hospital Girard, Kansas	Union Health Center New York, N. Y.
Chester Hospital Chester, Pa.	State Home Hospital Coldwater, Michigan
Arab Hospital Arab, Alabama	Scott County Hospital Oneida, Tennessee
St. Francis Hospital Milwaukee, Wisconsin	Orange County Hospital Orange, Texas
St. Joseph's Hospital London, Ontario, Canada	General Hospital Valdez, Alaska
Lakewood Hospital Morgan City, Louisiana	General Hospital Annapolis, Maryland
Dixie Hospital Hampton, Virginia	Ayden Clinic Ayden, North Carolina
N. E. Baptist Hospital Boston, Mass.	Liberty Co. Hospital Chester, Montana
Calais Regional Hospital Calais, Maine	Blue Hill Hospital Blue Hill, Maine
St. Elizabeth Hospital Utica, New York	Alexandria Hospital Alexandria, Virginia
Greenwood Co. Hospital Eureka, Kansas	Mayview State Hospital Mayview, Pa.
Hart Co. Med. Center Hartwell, Georgia	Ill. Central Hospital Chicago, Illinois

AMERICAN SOCIETY OF HOSPITAL PHARMACISTS—April 28-30, New York City. (Hotel Statler)

TRI-STATE HOSPITAL ASSOCIATION—April 29-May 2, Chicago, Illinois. (Palmer House)

ASSOCIATION OF WESTERN HOSPITALS—May 6-9, Los Angeles, California. (Statler Hotel)

CATHOLIC HOSPITAL ASSOCIATION—May 27-30, Cleveland, Ohio. (Statler Hotel)

INSTITUTE FOR HOSPITAL PHARMACISTS, CATHOLIC HOSPITAL ASSOCIATION—May 25-28, Cleveland, Ohio. (Municipal Auditorium)

AMERICAN MEDICAL ASSOCIATION—June 3-7, New York City.

INSTITUTE ON HOSPITAL PHARMACY (American Hospital Association)—June 24-28, Seattle, Washington.

RADIOISOTOPE TECHNIQUES COURSE, Co-sponsored by the Philadelphia College of Pharmacy and Science and the Philadelphia Hospital Pharmacists' Association—June 28, Philadelphia, Pennsylvania.

PREPARATION OF PARENTERAL PRODUCTS COURSE, Co-sponsored by Philadelphia College of Pharmacy and Science and the Philadelphia Hospital Pharmacists' Association—June 17-28 and July 8-19, Philadelphia, Pennsylvania.

INSTITUTE ON HOSPITAL PHARMACY (American Hospital Association)—August 18-23, Chicago, Illinois

AMERICAN HOSPITAL ASSOCIATION—September 30-October 3, Atlantic City, New Jersey. (Convention Hall)

ASSOCIATION OF MILITARY SURGEONS. October 28-30, Washington, D. C. (Hotel Statler)

FOURTH PAN-AMERICAN CONGRESS OF PHARMACY AND BIOCHEMISTRY—November 3-8, Washington, D.C.

MARYLAND-DISTRICT OF COLUMBIA-DELAWARE HOSPITAL ASSOCIATION (includes Hospital Pharmacy Section)—November 18-20, Washington, D. C. (Shoreham Hotel)

AMERICAN MEDICAL ASSOCIATION (Clinical Meeting)—December 3-6, Philadelphia, Pennsylvania.

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE (includes Pharmacy Section)— December, Indianapolis, Indiana.

on duty in the emergency room

Albumin/CUTTER

for rapid shock therapy

Albumin should be available for emergency treatment following trauma, hemorrhage or burns because it immediately restores and maintains an effective blood volume. An intravenous infusion of 50 cc. of 25% albumin may be expected to pull 175 cc. of fluid into the circulatory system *within 15 minutes.* It would require 250 cc. of plasma or 500 cc. of whole blood to duplicate this therapeutic effect. In addition, Albumin/Cutter is salt-poor, heat-treated against the hepatitus virus, and ready for immediate use. Also indicated in: acute barbiturate poisoning, cirrhosis, cerebral edema, nephrotic syndrome, hypoproteinemia.
Available in: 50 cc. emergency kits, complete with administration equipment; 20 cc. vials.

Make sure your supply of Albumin/Cutter is ample for emergencies as well as for routine hospital administraton.

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Broadswords are not standard equipment in hospital pharmacies these days . . . any more than your hospital's rising cost of overall operation is a flesh-and-blood dragon roaming the corridors.

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If your hospital is not yet preparing its own I.V. solutions under your supervision, you have an exceptional opportunity. Through the tested and proved ASPF procedures you can save thousands of dollars for your hospital; add to the prestige of your Pharmacy and materially increase your own importance as a member of the hospital team.

● *Send for your copy of* **"Why Hospitals Should Make Their Own I.V. Solutions"** *or ask your administrator to let you know when the Amsco man calls.*

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NEW MEMBERS

MARCH 1, 1957

The following ASHP members sponsored the New Members listed in this issue of THE BULLETIN. *The officers of the* SOCIETY *and the Committee on Membership and Organization appreciate the efforts of the individuals who have encouraged New Members to join the national organizations. Sponsors will be listed along with the New Members in each issue of* THE BULLETIN.

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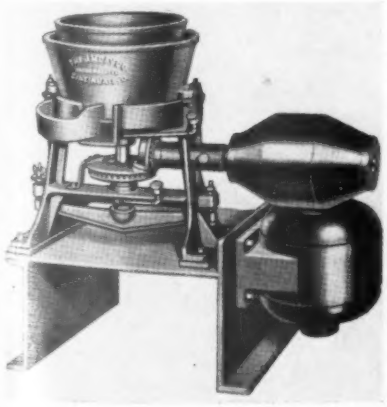

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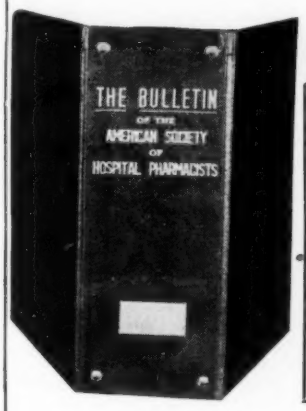

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in hospital pharmacy

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